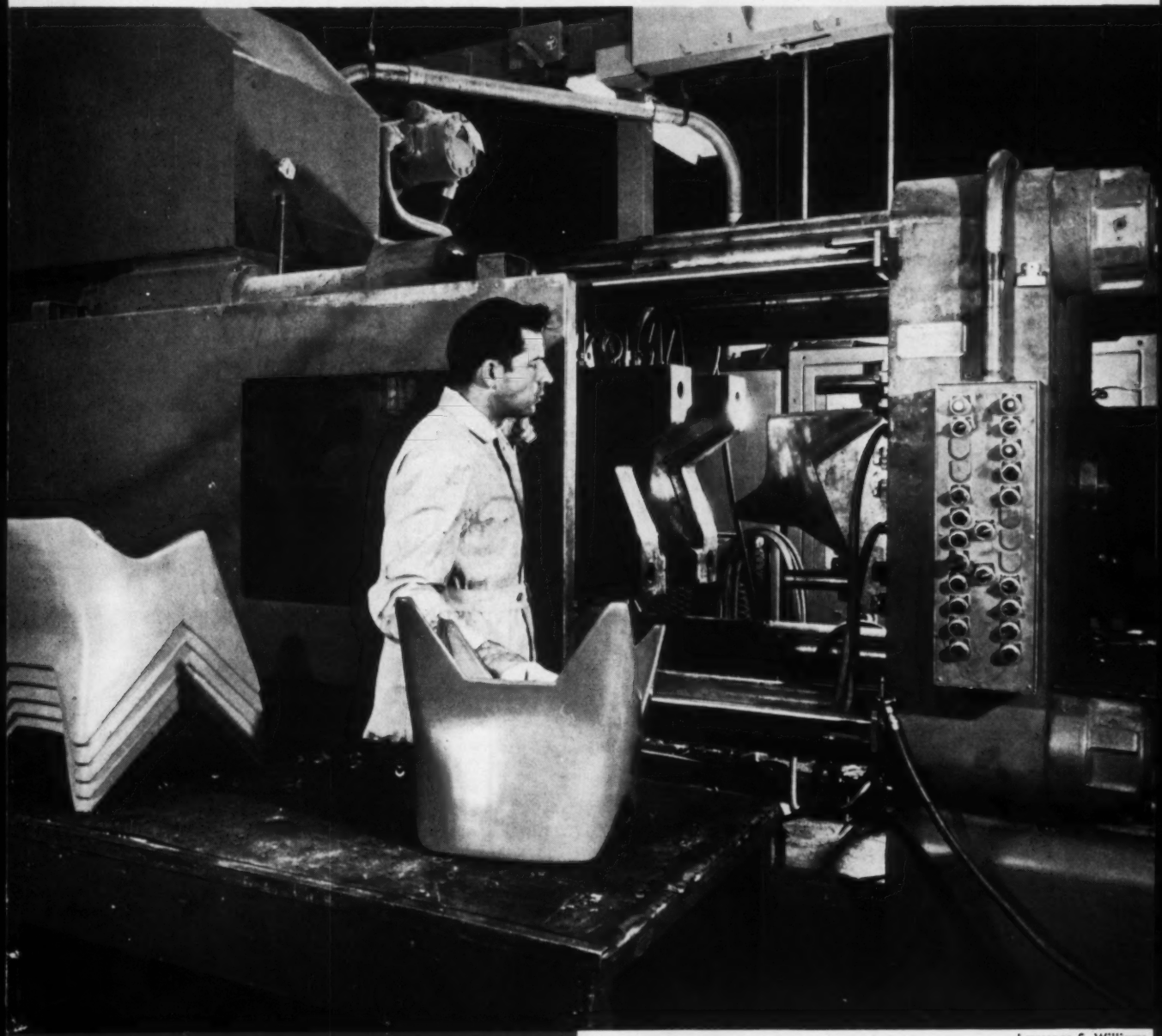
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication FEBRUARY 23, 1961



Lawrence S. Williams

★ Large, One-Shot Products Dramatize—

The Rapid Growth Of New Plastics p. 93

How Serious Is Auto Picture? p. 63

Exporters Raid U.S. Scrap p. 70

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HOB TWO FOR THE PRICE OF ONE

By switching to a lead-treated steel, Thor Power Tool Company cut the cost of these idler gears in half. Aristoloy 4620 (leaded*) provided high strength with excellent wear and shock resistance qualities. On gear cutting operations, machinability jumped from 35% to 66% (of B 1112). And there was a marked improvement in surface finish.

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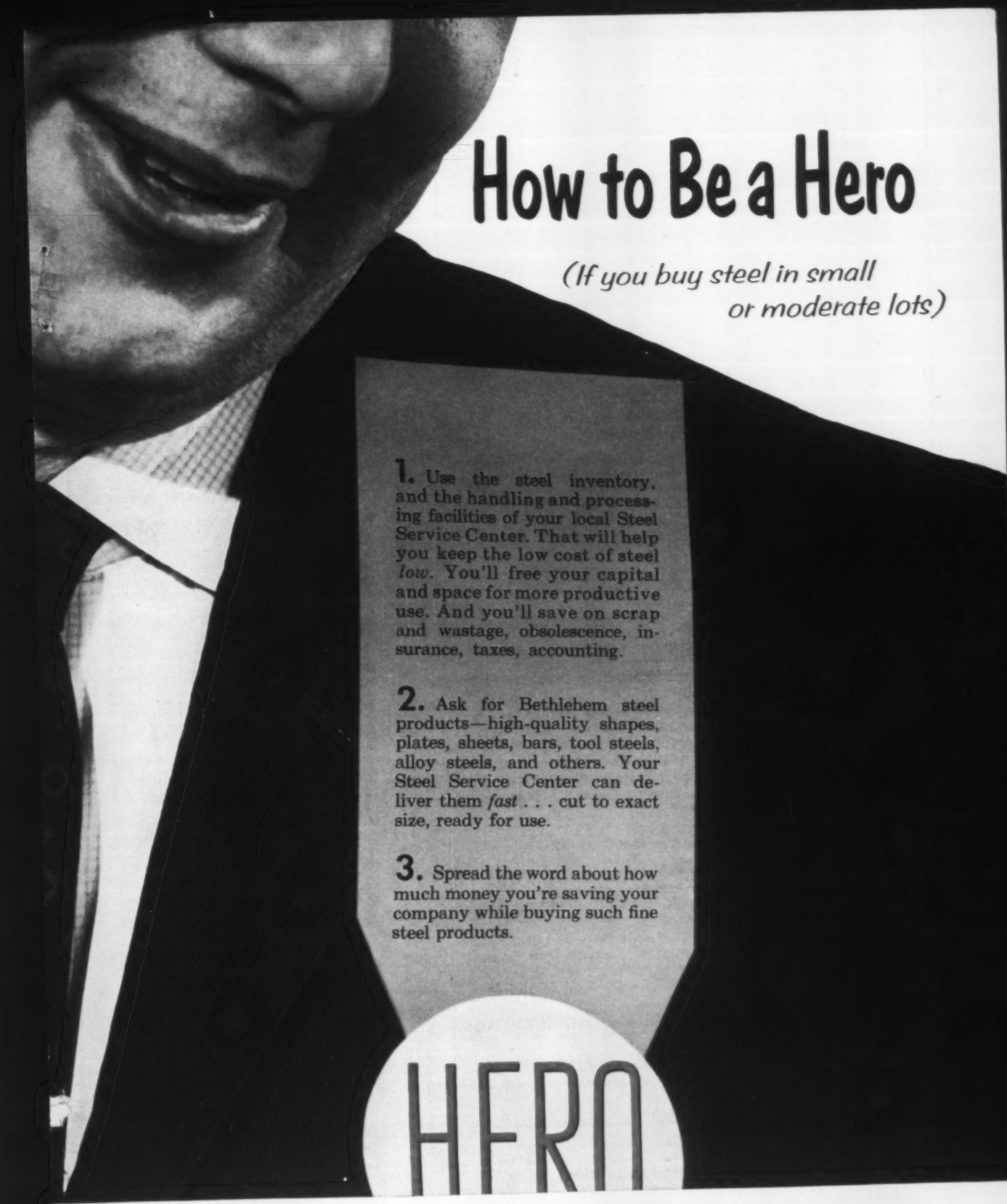

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February 23, 1961—Vol. 187, No. 8

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News of the Industry

CAR SALES SLUMP

Over Million Unsold—Automakers near spring with over a million

new cars unsold again. No one expects a 1958 recession low of 4.2 million units sold. But there is less talk of 7 million sales for 1961, more of 5.5 to 6 million sales. P. 63

PERSONNEL

Manpower Hunt—Industry leaders say the next ten years will bring a real shortage of skilled workers. Management replacements are disappearing. P. 65

PURCHASE ANALYSIS

Aids Buyers—Use of a new technique is paying off for metalworkers. It employs an engineering-purchasing team to brainstorm buying projects. P. 66

CONSUMER PRICE INDEX

Headed for a Revision—One of the most important economic bench-

Metalworking

Cover Feature

TRENDS IN PLASTICS—Plastics are moving into more functional jobs. Improved materials ease production headaches for fabricators such as the Consolidated Molded Products Corp., Scranton, Pa. P. 93

marks—the Consumer Price Index —will be updated. Surveys starting now are aimed at modernizing the Index to reflect changes in buying patterns. P. 71

WEST COAST

Defense Change Reaction—Polaris contractors and planemakers welcomed the President's revamped defense policy. But missile makers fear quick phase-outs for some projects. So the over-all reaction was mixed. P. 81

Engineering-Production Developments

NEW STAINLESS ALLOY

Curbs Wrinkling—The auto industry uses AISI Type 430 stainless steel for most trim applications. But automakers aren't happy with the rippled finishes that result when 430 stainless is stretch formed. A pinch of columbium yields wrinkle-free finishes. P. 96

ELECTRICAL EXPLOSIONS

Shape Hard-to-Form Metals — Electrospark forming is the key to a new low-cost shaping method. Controlled electrical blasts create shock waves of immense force. No TNT, dynamite, or other chemical explosives are used. P. 98

INVESTMENT CASTINGS

Spur Interest — The investment casting process is on the move again. Latest developments include a method for casting, under vacuum, with controlled grain sizes at pre-selected sites. Prospects appear to be very bright. P. 100

GRINDING WHEELS

Get Quick Mix—One millionth of a pound is very hard to measure. In fact, it's almost impossible. However, one grinding-wheel maker is working to these tight tolerances. The secret? Automated mixing and measuring. P. 102

WELD DISTORTION

Avoid Problem—There are ways to avoid weld distortion, even on critical steam turbines. Sound welds can be produced, if engineers follow a systematic approach. A new hot plate keeps preheat at the desired level throughout the entire weld cycle. P. 104

Market and Price Trends

BATTLING IMPORTS

Steel Finds a Way—Producers of reinforcing bars have lost a large part of their markets to imported bars. But they've found a way to get some of it back. P. 68

SCRAP EXPORTS

Higher Prices? — Scrap exports are the only sustaining force in the weak U.S. scrap market. But domestic interest could strengthen sales and prices. P. 70

AUTOMOTIVE

Plastics Push Ahead — Greater use of plastics in cars is expected as costs decrease. One plastics man looks far ahead and sees a plastic car in the automotive future. P. 79

STEEL SUMMARY

Wait for an Upturn—Steel marketers are looking hopefully ahead to spring. But real pickup is unlikely until major steel users increase buying. P. 129

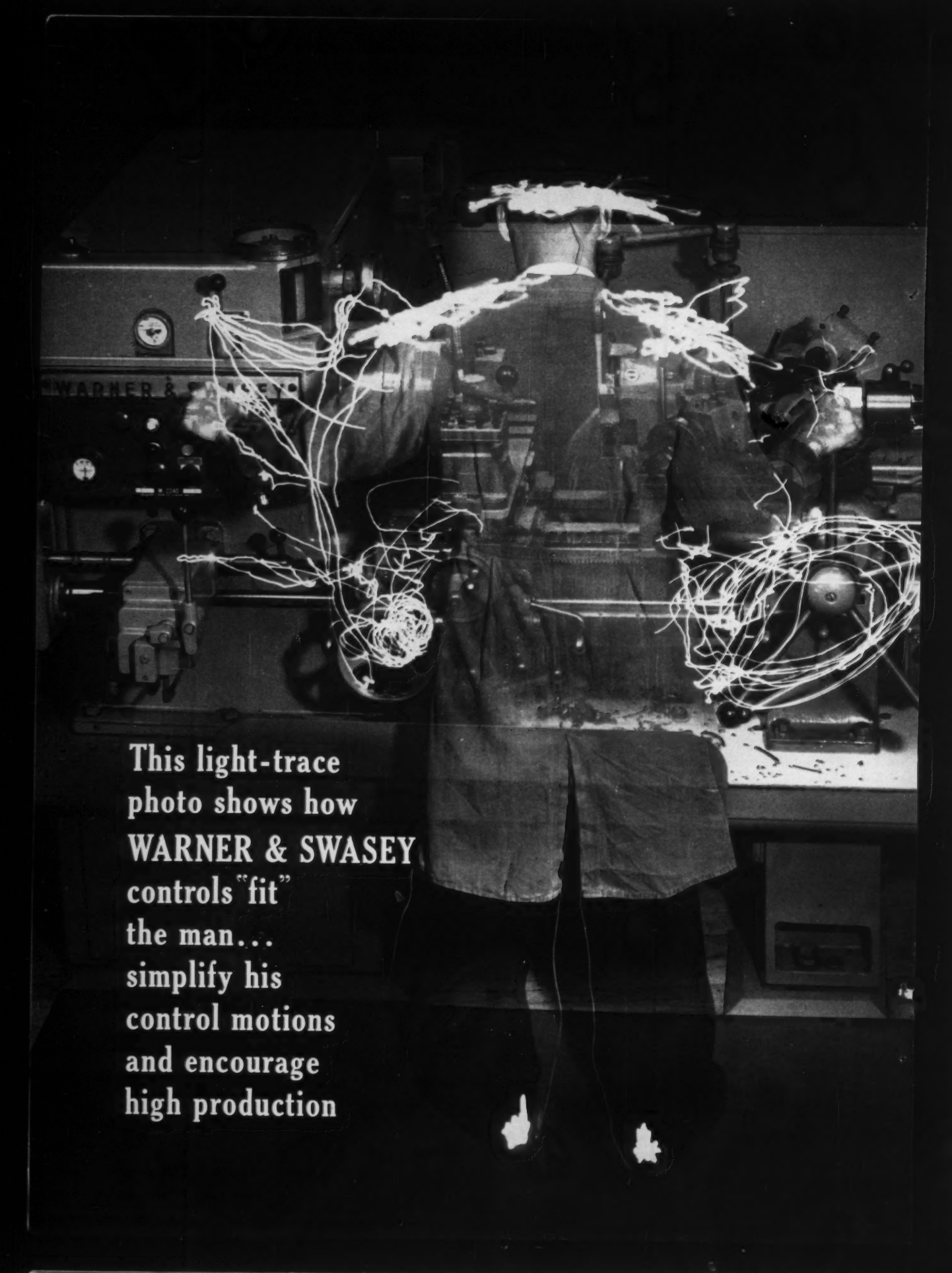
PURCHASING

Outlook for Conveyors—Stability is the forecast for conveyors in 1960. Slightly higher sales but few new products is the consensus of manufacturers. P. 130

NEXT WEEK

BETTER MANAGERS

A Fresh Approach—Managers are not made. They are self-developed. Morehead Wright, head of General Electric Corp.'s Management Research and Development Institute, next week tells how this approach works.


This light-trace
photo shows how
WARNER & SWASEY
controls "fit"
the man...
simplify his
control motions
and encourage
high production

A Citizen's Report On the State of the Nation

Not long ago, President Kennedy gave us a report on our nation. It was a pretty grim one. There is no doubt that much of what he said was —and is—true.

But now that we have the President's message, perhaps we ought to have one from just an ordinary citizen.

This is a great country we live in. Ask anyone who has been abroad. Ask those who were stranded in Cuba, or on the high seas, or in nations where high-handed dictators are in charge.

Look at the "real" gain in wages and fringe benefits. Over the years, the amount of disposable income over and above necessities has been tremendous. The real gain in wages compared with the cost of living over the years is a great big plus.

What about unemployment? It is severe. No one out of work is happy. Those who must work are frustrated because they can't. Those who thrive on handouts often see their doles slipping away.

But talk to those who were out of work in the thirties, or even in the twenties. Then there were no 39-week benefits that often come close to 50 percent of a man's pay. There was, as a rule, nothing. Those who had saved spent all of their savings before they went on relief, which they detested.

What about education? For those who really want to work for it, their chances are greater than ever before. It comes either free or at a great discount. But you have to work to get this windfall. Efforts to make it easier to obtain cannot be classed as progress.

Look at our health situation. The middle class "pays." The rich have the money to pay. The poor can and do go to clinics where they get the best treatment possible.

Perhaps you question civil rights? On a comparative basis, the minority groups are better off here than anywhere in the world.

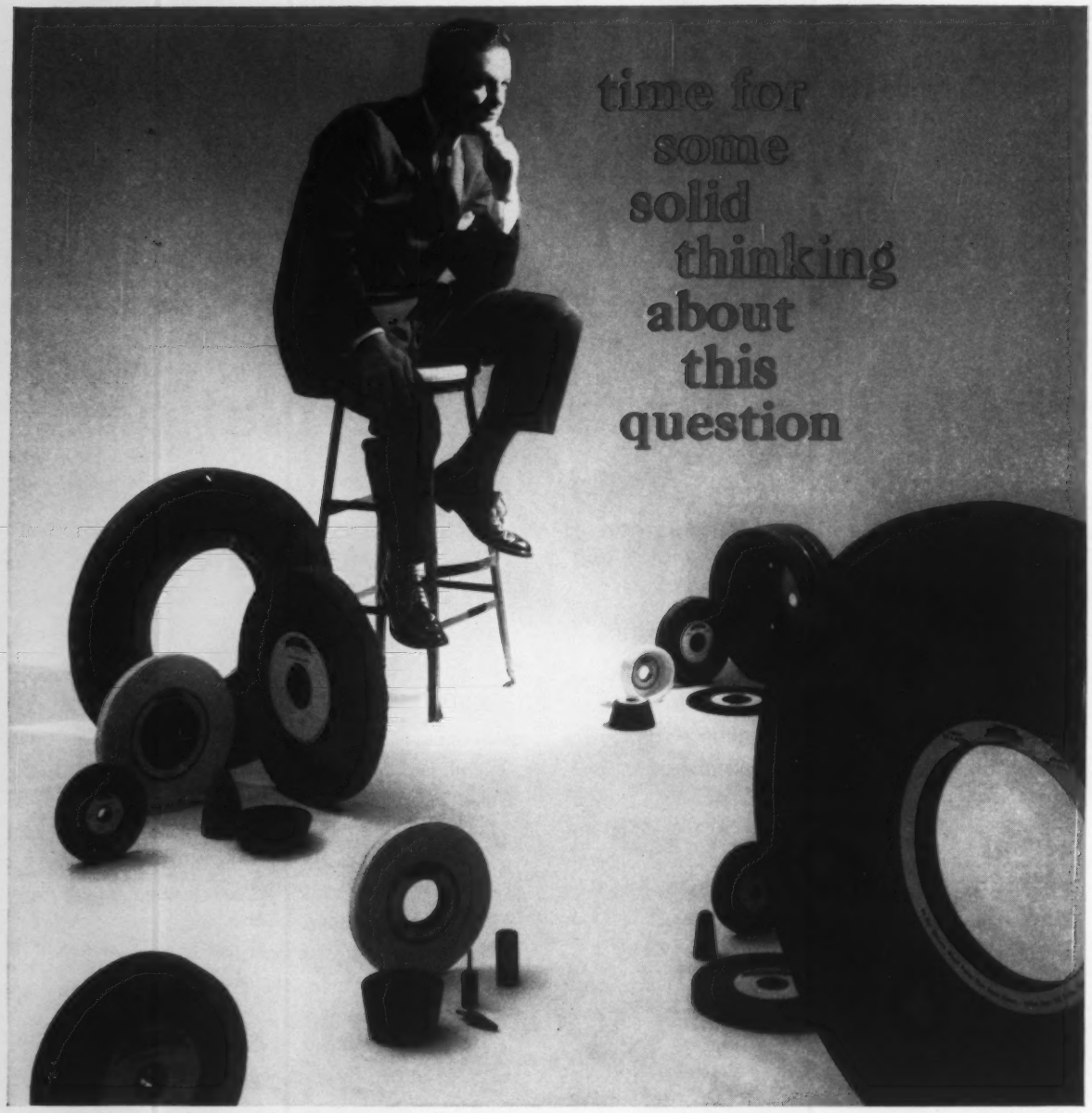
Of course the millenium has not been reached. It never will be. But it is high time to realize that —taking in every factor and condition—this is still one of the best havens in the world for the free individual.

That goes for political, economic, and cultural freedom. Add another factor: We are the strongest nation militarily in the world.

Let's remember these pluses as we cry over the minuses in the months to come!

Tom Campbell

Editor-in-Chief



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No Cheer in Latest Indicators

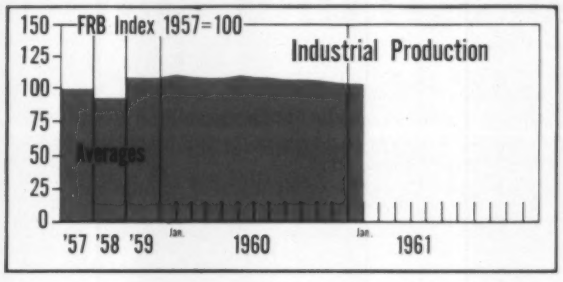
Businessmen looking for cheer in economic indicators will have to wait another month, and more. January statistics are not encouraging. And no one who follows business news can see much in February that warrants any great optimism.

About the best that can be said is that this week's disappointing statistics could have been forecast. The January pattern reflected in industrial production, personal income, and other indicators, was easily detected. Business received no lift from steel and other basic metals and was let down further by automotive and other major areas of manufacturing.

Production Continues to Sag

Not too long ago, a business upturn "after the first of the year" was confidently expected. But as manufacturing of durables dropped off, followed by nondurables, it became apparent that January was not to be a recovery month.

The Federal Reserve Board's Index of Industrial Production dropped one point to 102 (1957-59 = 100.) It was the sixth straight month of decline. Perhaps



surprisingly, the index for nondurables, which is less volatile than durables, fell off two full points. Durables fell off one point to 95, compared with 111 a year ago.

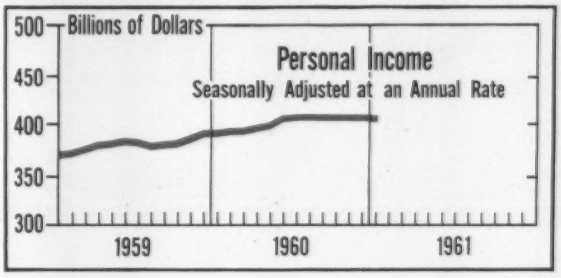
Consumer Price Index to Be Revised

An important business indicator — the Consumer Price Index—is being revised and brought up-to-date. Surveys started this month on consumer income, spending and saving by the Labor Dept.'s Bureau of Labor Statistics are aimed at modernizing the Index. (See story, p. 71.)

They will take place this year and next in 66 cities within the U. S. Many important changes in consumer buying patterns have taken place since the Index was last revised in 1951, says Ewan Clague, commissioner of Labor Statistics.

Income Drop Becomes More General

Reflecting layoffs and declines in the general economy, personal income also dropped off early this year. The seasonally adjusted rate of $406.3 billion



in January is down $600 million from December. The drop was the third consecutive monthly decline in total personal income. It is the eighth straight drop in factory payrolls. Incomes of business and professional people also dropped, indicating that the business decline is becoming more general.

Skittish on Capital Programs

Here and there around industry, some top management men are being frustrated by cutbacks in capital programs. There are two reasons: They know this is a good time to get value; improvement may be vital to compete. One recent instance is a steel company which had even arranged financing and was ready to go. At the last minute, a major portion of the entire project was killed off by the board of directors, much to the working management's disappointment.

Air Conditioners Optimistic

One of the few industry groups looking for improvement this year is the air conditioning industry. Based on expanding construction of central units, manufacturers expect gains of from 10 to 20 pct in 1961. Biggest gains will come in central units for industrial, commercial, and apartment buildings. Textile, pharmaceutical, and electronic plants are among the leading markets.

More Bad News for Business

More government indicators released this week confirmed earlier reports on business. New orders for durable goods were down 2 pct in January from December; insured unemployment reached the highest level ever recorded. One bright spot: Housing starts moved up.

Another good customer is assured

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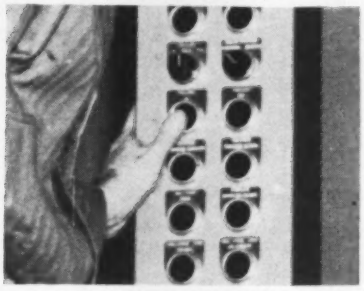
URW: Who Is Allowed To Push the Buttons?

Who gets to push the buttons in an automated factory?



Automation: Who's finger?

Unions have generally assumed that machines in automated factories would be run by their members. Most managements have gone along with this. But, then, few operations are so highly automated that they don't need at least some attention from operators.

As technology progresses, this could change. Then what?

Supervisors may push the button that sets a highly-automated operation in motion, was the ruling of an umpire in a dispute between Goodyear Tire & Rubber Co. and Local 12 of the United Rubber, Cork, Linoleum and Plastic Workers of America.

Automatic controls had been installed on a machine, eliminating all repetitive operations and the need to watch it. Operation became simply a matter of inserting a prepunched IBM card for a particular product into a control unit, then pushing a button. A supervisor was doing this. Before the change, workers operated it.

Said the umpire: "The button-pushing takes only seconds and is performed only a few times per shift. It is simply a signal or instruction to the machine. It is of the same character as the issuance of instructions to . . . bargaining unit employees, perhaps by means of an intercom system on which a button must be pressed to talk. Such direction of work is essentially supervisory in nature."

But, the umpire adds, work should be assigned to a bargaining unit member when the machine is operated manually. Exceptions: emergency or when giving instructions. The same applies when there is physical work involved.

Hoffa: Resents Snub In Jobless Talks

Teamsters President J. R. Hoffa didn't think much of Labor Secretary Goldberg's tour to survey the unemployment situation.

Mr. Hoffa does not like the fact that the Labor Secretary hasn't asked the Teamsters to take part in meetings to talk over unemployment and other economic matters facing unions.

Advisory Committee Named

Twenty-one members have been named by President Kennedy to his Advisory Committee on Labor-Management Policy.

In an executive order, the President directed the committee to advise and consult with him regarding **"policies that may be followed by labor, management, or the public which will promote free and responsible collective bargaining, industrial peace, sound wage and price policies, higher standards of living, and increased productivity."**

Secretary of Labor Arthur J. Goldberg and Secretary of Commerce Luther H. Hodges will alternate as chairman of the committee. Mr. Goldberg will be the first-year chairman.

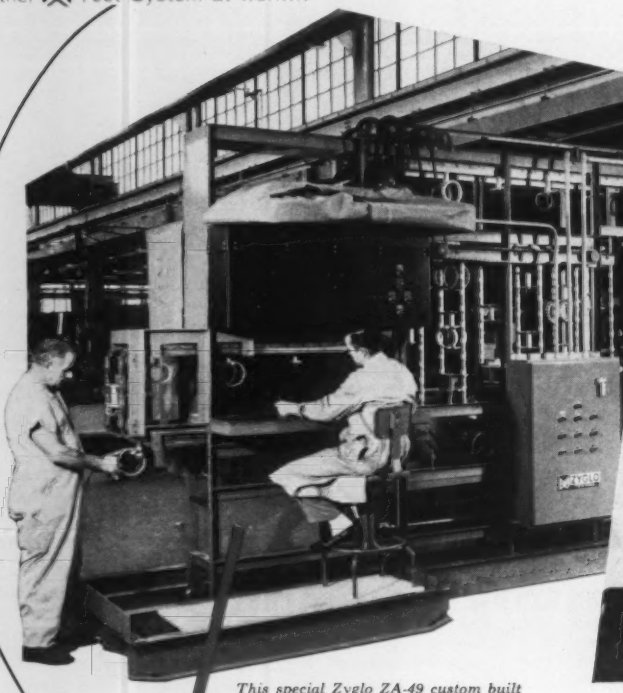
Other members appointed to the committee are:

Management: **Thomas Watson,** president of International Business Machines; **Joseph Block,** president of Inland Steel Corp.; **Henry Ford,** board chairman of Ford Motor Co.; **J. Spencer Love,** board chairman of Burlington Mills; **John Franklin,** president of United States Lines; **Richard Reynolds,** president of Reynolds Metals Co.; and **Elliott Bell,** editor and publisher of Business Week.

Labor: **George Meany,** president of AFL-CIO; **Walter P. Reuther,** president of United Auto Workers; **David Dubinsky,** president of the International Ladies Garment Workers' Union; **George M. Harrison,** president of the Brotherhood of Railway Clerks; **Thomas Kennedy,** president of the United Mine Workers; **David J. McDonald,** president of the United Steelworkers of America; and **Joseph Kennan,** secretary-treasurer of the International Brotherhood of Electrical Workers.

Public: **George W. Taylor,** professor of business and economics, Univ. of Pennsylvania; **Ralph McGill,** editor of the Atlanta Constitution; **Clark Kerr,** chancellor of the Univ. of California; **Arthur Burns,** chairman of the National Bureau of Economic Research; and **David L. Cole,** Paterson, N. J., arbitrator and former director of the Federal Mediation and Conciliation Service.

Another Ⓜ Test System at work...



This special Zyglo ZA-49 custom built for SKF Industries, includes an endless conveyor to move parts through the various inspection processing steps in timed sequence. One man can handle entire operation.

Magnaflux Field Engineer, (at right), discusses acceptance standards with Rudolph Sansonneti, Chief Inspector and Henry McNeal, Production Engineer, Airborne Accessories Corporation, Hillside, N. J. Unit is standard Zyglo ZA-37.

You Save Money Finding Cracks with ZYGLO—Large or Small

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The inset shows a hand-operated Zyglo ZA-37 used to test critical aircraft parts—from small screws in batches, up to 9-lb., 6" x 18" components.

Dozens of other Zyglo Units and Systems—larger, smaller and in between these examples—are available in standard, productionized-standard and specially engineered installations. Whether you need to test thousands of small parts per hour, a few large ones, or any combination, there's a Zyglo to meet *your* specs and savings objectives.

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★ Impact of Defense Speedup

The nation's defense industry will soon begin to feel the effects of slowly but continually rising defense spending. All evidence points to mounting spending year by year under the guidance of President John F. Kennedy.

Missile industries will benefit first and most.

Aircraft and shipbuilding contractors are next in line.

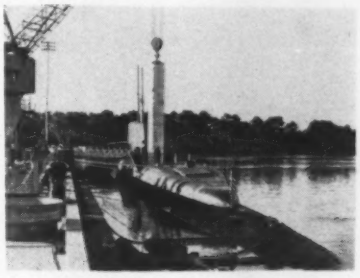
Industries keyed to military weapon and equipment modernization also are at the top.

This fiscal year—ending June 30, 1961—will see spending slightly higher than the $41.5 estimated by former President Eisenhower.

The major effects of Mr. Kennedy's big defense push will come from the fiscal 1962 budget. The Pentagon, at President Kennedy's orders, is now studying what program changes should be made in Ike's last budget. Word from the Pentagon is that changes on 25 or 30 items are being considered for strengthening defenses. Changes are set to go before Congress in April.

It is expected that the Chief Executive's defense program will cost a good deal more than the present $42.9 billion estimate for 1962.

The President has already pointed out specific areas for increased defense activity.



POLARIS: More, faster.

He calls for speedups of the Polaris, Minuteman, Nike Zeus and other missiles. The purchase of over 50 jet transports for military airlift modernization has already been started.

Increased shipbuilding for the Navy is being planned. A speedup in modernization of Army equipment is a sure thing.

The outlook for the future is for even more spending. The increase will get bigger, faster as the Kennedy program gets implemented.

■ Hodges Aids Plant Location

The U.S. Dept. of Commerce is making studies to find where five major industries could most profitably build new plants.

Secretary of Commerce Luther Hodges says he ordered the Department to have ready by mid-summer studies on availability of raw materials, markets, transportation facilities, and labor for the industries.

Private research firms are making the studies of requirements of the electrical machinery, container, industrial electronics, fabricated plastics, and scientific instruments industries.

■ President Pushes Small Business Aid

Perennial pressures to give small business a bigger share of defense contracts have suddenly become more than talk. Action, under the direction of President Kennedy, is being taken.

The President reports that the criteria by which small firms are made eligible for defense contracts will be increased 25 pct.

It is hoped that this action, coupled with recommendations by the Senate Small Business Committee, will stop the steady decline of small business share of defense buying. This share of total military procurement has decreased from 25.3 pct in 1954 to 16.1 pct in 1960.

The Senate Committee recommends procurement specialists be supplied to buying centers to screen Federal purchases in the interest of small business. It also suggests additional legislative authority be given the Small Business Administration to assist small manufacturers to bid on defense contracts.

■ Defense Waste Study Advanced

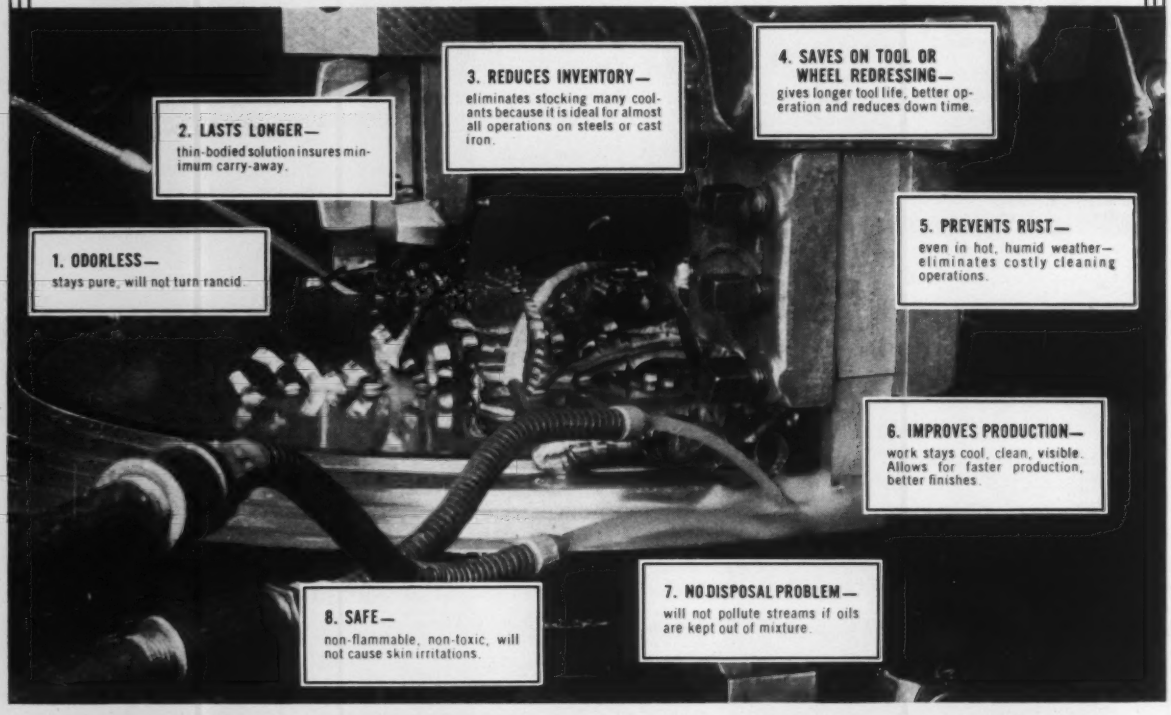
Sen. Paul H. Douglas, Congressional leader of the fight against waste in defense procurement, and Budget Director David E. Bell will meet to discuss military waste at the suggestion of President Kennedy.

The President shows renewed interest in Sen. Douglas's claim that more than a billion dollars could be saved by cutting down Pentagon waste. (See IA—Feb. 16, '60, p. 73.)

■ Udall May Favor Mining Tariff Help

The Dept. of Interior's past policy of opposing tariff aid for the minerals industry may be ready for a turnabout. Indications from Interior Secretary Stewart L. Udall are that his department feels help for the domestic mining industry is urgently needed. Congressional moves to help lead, zinc, copper and other minerals may soon get the Interior Dept.'s backing.

USE ONE COOLANT TO SAVE 8 WAYS!


1. ODORLESS—
stays pure, will not turn rancid.
2. LASTS LONGER—
thin-bodied solution insures minimum carry-away.
3. REDUCES INVENTORY—
eliminates stocking many coolants because it is ideal for almost all operations on steels or cast iron.
4. SAVES ON TOOL OR WHEEL REDRESSING—
gives longer tool life, better operation and reduces down time.
5. PREVENTS RUST—
even in hot, humid weather—eliminates costly cleaning operations.
6. IMPROVES PRODUCTION—
work stays cool, clean, visible. Allows for faster production, better finishes.
7. NO DISPOSAL PROBLEM—
will not pollute streams if oils are kept out of mixture.
8. SAFE—
non-flammable, non-toxic, will not cause skin irritations.

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Try **HAMIKLEER** *at our expense.* **SEND FOR A FREE SAMPLE** *to test on your own metalworking operations or write for free literature.*

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Service Representatives in Principal Cities

Steel from Singapore Is a Possibility

A six-man team from the United Nations is now studying the possibilities of establishing an iron and steel industry in Singapore. And the committee is already considering several potentials.

One is a long-term project of blast furnaces and 500,000-ton steel production capacity. Another possibility, short-term to meet local needs, calls for a rolling mill and a melting furnace with the capacity to make 20,000 to 30,000 tons annually. This plan is based on shipbreaking as a source of plate and scrap steel.

Still another idea is to use a small integrated plant, including rolling mills, scrap facilities, steelmaking furnaces and blast furnace. Ore and coal from the immediate area would be used with a capacity of about 60,000 tons.

The committee is expected to make a report to the UN after a three to four-month study of the situation.

Steel Imports Stay Higher Than Exports

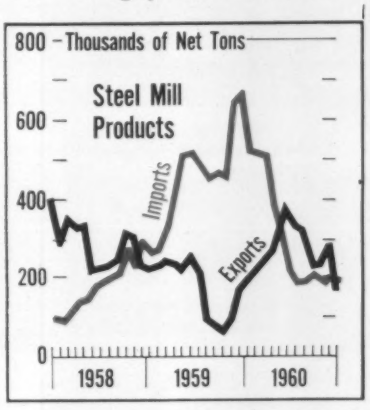
Imports of steel mill products in 1960 passed exports in tonnage for the second straight year.

Figures released this week by the Dept. of Commerce show, however, that in terms of value for steel mill products, exports proved profitable for the United States.

Total exports of steel mill products last year totaled three million tons with a value of $600.8 million. Imports, on the other hand, totaled 3.4 million tons with a value of $448.8 million.

During December, imports of steel mill products dropped from the November figure of 199,000 tons to 189,000 tons. Exports dropped even more drastically from November's 234,000 tons to 162,000 tons.

The export pattern last year shows that the peak was hit in June when tonnage equalled 382,000 tons. The dropoff to December's low was largely due to a cutback in Britain's auto production and a general decrease in world demand.



Belgium and Luxembourg were again the chief suppliers of steel mill products to the U. S. West Germany, France, Japan, England and Canada also gained major portions of the market.

As for items, concrete reinforcing bars, steel pipe and tubing, and wire rods grabbed the largest portion of the U. S. market last year.

More Jobless Canadians

Unemployment in Canada is more severe than in the United States. The Bureau of Statistics in Ottawa reports that Canadian unemployment reached 693,000 in mid-January.

The number of unemployed—10.8 pct of the work force—is the highest in 15 years in Canada. Unemployment in the U. S. is 6.6 pct of the work force.

U. S.-Red Trade?

A Washington trend is shaping up for more trade between the U. S. and the Communist World.

Latest evidence of the trend: Sen. Allen J. Ellender, (D., La.,) recommends the U. S. "reevaluate" the so-called 1951 Battle Act which restricts trade with Iron Curtain countries. The senator, long-time critic of the foreign aid program, suggests that "every effort be made to increase" East-West trade.

Also legislation has been introduced in Congress to permit the U. S. to make loans to Communist-dominated countries. And, President Kennedy suggests we should improve relations with Poland and other satellite countries through trade.

Reds Seek Austrian L-D Equipment License

Russia, despite a questionable attitude regarding foreign patent rights, is approaching the Austrian government with hopes of getting licenses for L-D oxygen steelmaking equipment in the U. S. S. R.

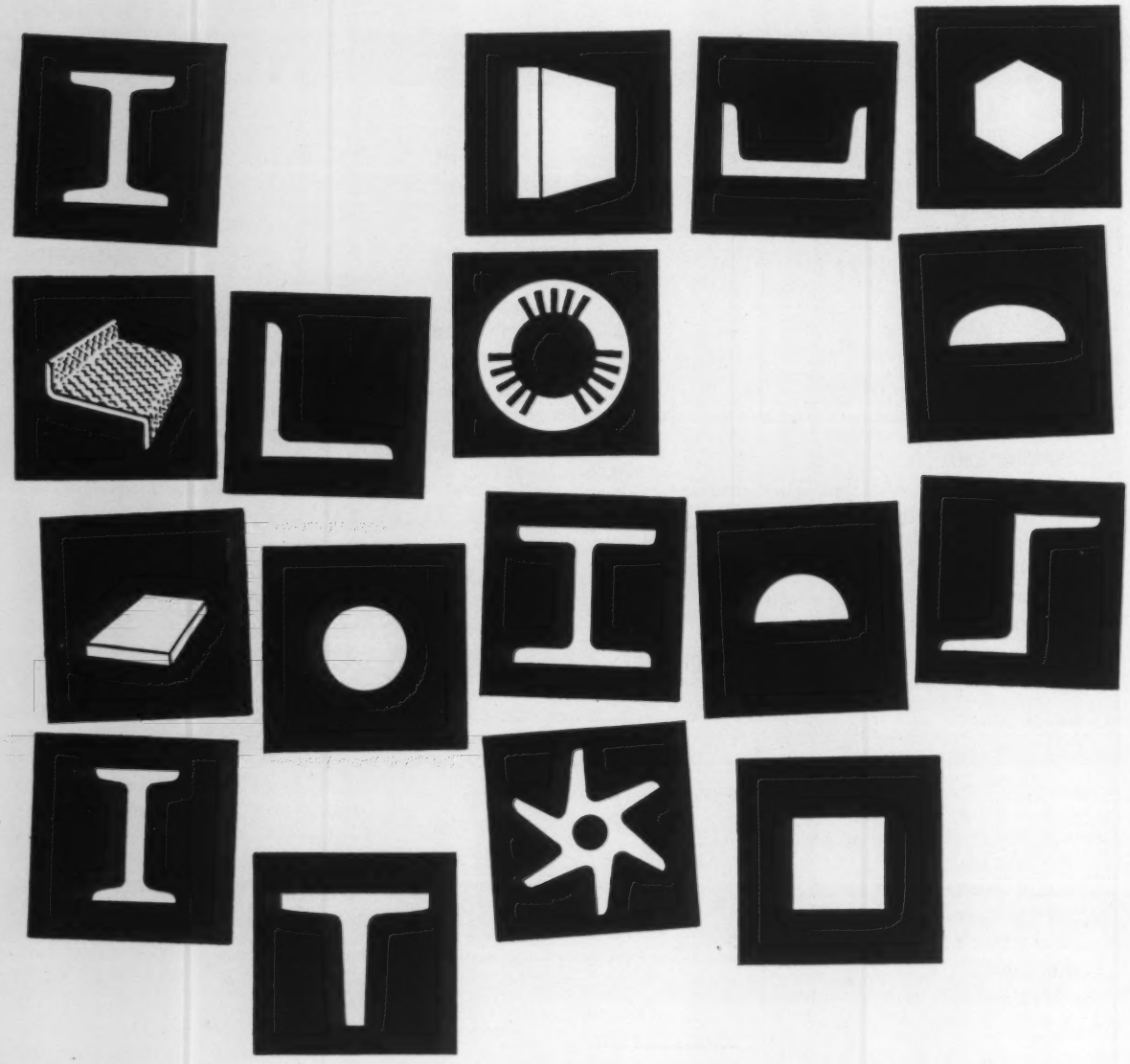
The Reds are asking Austria to take half the license payment in convertible currency and the other half in Russian products. Apparently the idea was first discussed when Russian Premier Nikita Khrushchev visited the United Austrian Iron and Steel Works at Linz.

Initial Austrian reaction to the idea appears favorable.

Steel for Russia

A recent trade report from Japan suggests that more Japanese steel may be finding its way behind the Iron Curtain.

From December, 1957, when the Japan-Russia trade treaty was signed, through August, 1960, nearly $46 million in Japanese steel has been sold to Russia. More than half of this amount—$26.5 million—was sold in the last six months of the report.



THE METALOGICS OF CARBON STEELS

There *are* differences—very real and important differences —in carbon steels, and in all the services required to supply them. You can always count on Ryerson for more in quantity, quality and quickness—more for your carbon steel buying dollars. So be "Metalogical"—call Ryerson.

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Automated Riveting

Traveling along an 80-ft path, a tape-controlled riveting machine drills and sinks rivet holes. It plants one of five different rivet diameters in position. Then it heads each rivet and grinds the exposed surface down to flush dimensions. A 35-mm movie film serves as the control media. Each rivet bond is completely leak free, even though no sealant is used in the assemblies.

Checks Ultrathin Metals

Reading to 0.000005 in., an electronic comparator gages ultrathin metals at the Somers Brass Co., Inc. This instrument has a variable-pressure attachment. Thus, it provides 2-, 4-, 8-, 16- and 40-oz gaging pressures. A 4½-in. deep throat allows the gaging of wide pieces.

Unit Degasses in Ladle

A second major stainless producer is getting into ladle degassing. Crucible Steel Co. of America is now operating a Dortmund-Hoerder Huettenunion vacuum degasser. This unit uses a snorkel-tube device to draw hydrogen, oxygen and nitrogen from ladle steel. A pilot degasser is also being installed at the steel mill.

New Stainless Alloy

Containing 0.7-pct aluminum, a new chrome-nickel stainless alloy boasts many advantages over free-machining AISI Type 303 stainless steel. The newcomer features improved corrosion resistance, easier machining, longer tool life and smoother finishes. It also resists longitudinal splitting. Users report that the new alloy yields 15-40 pct savings in machining rates.

Plastics Fabrication

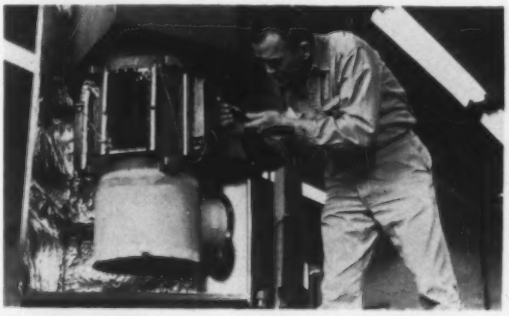
Depending on design criteria, machining of thermoplastic parts may be cheaper than molding for runs in excess of 200,000 pieces. Several factors lower the machine-vs.-mold break-even point in favor of molding. These factors include: Small part size, complex contours, abrupt changes in contour, contours in several planes and integral inserts. Factors favoring machining: Large part size, thick wall sections, close tolerances, hard-to-mold designs, frequent design changes and the need for early delivery.

Filters Furnace Smoke

A new smoke-filtering system for electric furnaces has been announced by the United States Steel Corp. and the Allegheny County (Pittsburgh) Health Dept. Now under construction at U. S. Steel's Duquesne Works, the new system operates like a vacuum cleaner. It will filter smoke from five electric furnaces. Pittsburgh steel mills are under pressure to comply with the standards of a tough new air-pollution code.

Industrial Heating Unit

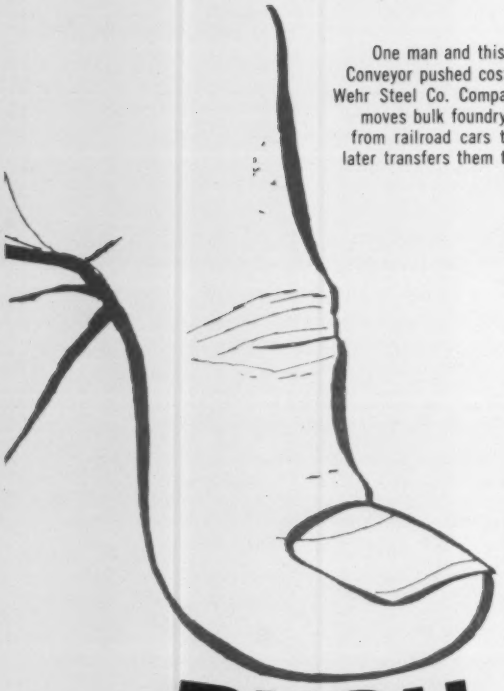
Electric power from a built-in thermoelectric generator drives the blower on a new gas furnace. Rated at 130 w, the generator converts heat from



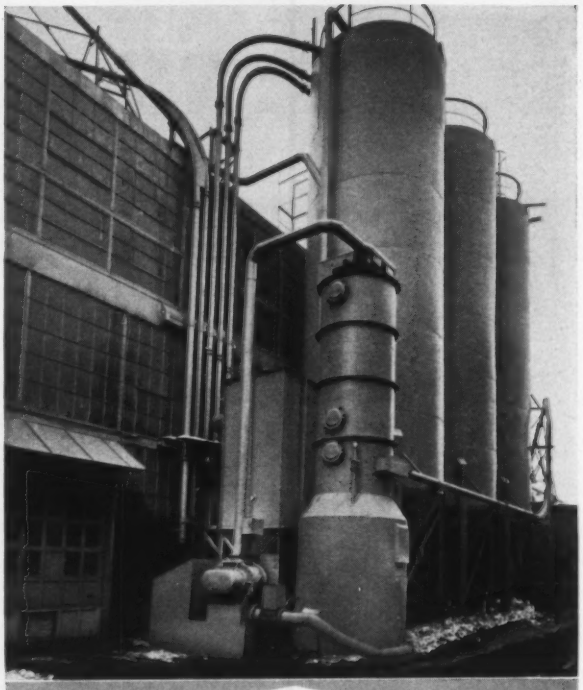
burning gas directly into electricity. This generator contains no moving parts. When the furnace goes on, the generator's power builds up gradually. Electrical connections aren't needed.

Pinpoint Metal Behavior

Use of a thermionic-emission microscope at a midwest technical center has turned up noteworthy results. Motion pictures of micrographic studies show how various transformations occur in steel. They also disclose other facts about the behavior of metals. These studies may lead to more scientific metallurgy, superior materials and a better understanding of design factors.



One man and this Airstream Conveyor pushed costs down at Wehr Steel Co. Compact system moves bulk foundry materials from railroad cars to storage, later transfers them to process.



PUSH COSTS DOWN....

move up to modern handling

look how these

foundries cut costs with Dracco Airstream Conveyors

Major automotive foundry saves $32,000 a year in labor costs! Airstream Conveyor unloads core binders 400% faster than manual methods, moves them at 20 tph to eight storage bins without intermixing.

Wehr Steel Co., Milwaukee, realized multiple cost savings with its Dracco Airstream Conveyor. Bulk buying cut bentonite costs over $12,000 a year, reduced sand and other material costs $3-$5 a ton. Bulk handling slashed labor costs 50%.

Large aluminum foundry by-passes costly handling by air conveying sand from railroad cars to 100-ton silo at 10 tph. Labor required: one man. Cost of bags: eliminated. And there is no dust, waste, safety hazards or expensive maintenance.

Kelsey-Hayes Co., Detroit, air conveys seacoal and bentonite to mulling stations. One man with a push button-controlled Airstream system pushes costs down here, assures 100% material usage with no dust or waste.

Modernized bulk handling with Dracco Airstream Conveyors introduces improved productivity at lower cost. Savings result from bulk buying, less labor, faster handling, cleanliness, safety and simplified maintenance. Why not include a Dracco Airstream Conveyor in your cost reduction program?

For expert assistance when you move up to modern handling, contact: Dracco Division of Fuller Co., Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

Write today for further information. Ask for 32-page Bul. 530, "Dracco Airstream Conveyors".

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL INDUSTRIES

Let us make your "specials"—

Headed . . . threaded . . .
punched . . . bent . . . forged . . .
rolled . . . machined . . .
heat-treated . . . coated

The design skills of Bethlehem's fasteners engineers have saved countless dollars for people using steel fasteners for special applications. Some of these specialty products are not fasteners at all, but *all* of them are produced in our fasteners plants at Lebanon, Pa., Seattle, South San Francisco, and Los Angeles.

Steel

for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL

BETHLEHEM STEEL

BETTER JOB AT HALF THE COST

OLD BOLT—This sleeve-type bolt was used as a steel strapping handle for railroad cars. The weld was expensive, and the part couldn't handle heavier loads.

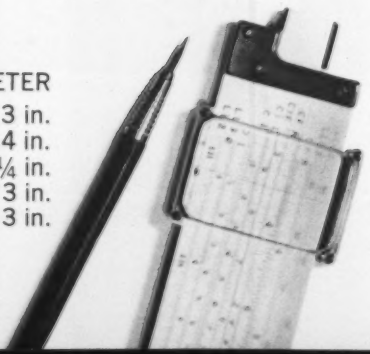
NEW BOLT—Bethlehem fasteners engineers designed this forged-eye bolt. Strength was greatly increased by new design and use of heavier material. And all this—at half the original cost.

Many special fasteners cost much more than they should. But if your steel "specials," like these, were redesigned by Bethlehem fasteners engineers, it's quite possible your costs would be cut substantially. We can design and make *any* component that can be upset, forged, or machined.

Bethlehem engineers

MANUFACTURING RANGES

PROCESS	DIAMETER
Roll-threading	¼ in. to 3 in.
Cut-threading	¼ in. to 4 in.
Cold-heading	¼ in. to 1¼ in.
Hot-upsetting	¼ in. to 3 in.
Bending	¼ in. to 3 in.



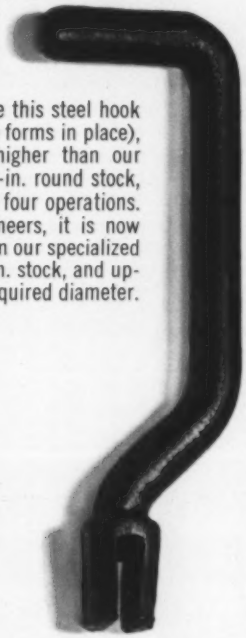
Steel

for strength
. . . economy
. . . versatility

COLD-FORGED AT CONSIDERABLY LESS THAN MACHINING COST

This intricate stud, used in a clutch mechanism, has an offset head. Originally turned from bar stock on a screw machine, it is now cold-forged in a Bethlehem fasteners plant at a substantial reduction over the original machining cost. The redesign for forging, which also resulted in a stronger, longer lasting part, was conceived by Bethlehem's experienced staff of fasteners engineers.

OUR PRICE IS LOWER THAN THE CUSTOMER'S COST



When our customer made this steel hook bolt (for holding concrete forms in place), his in-plant costs ran higher than our selling price. He used ¾-in. round stock, and his process required four operations. Redesigned by our engineers, it is now done in two quick steps on our specialized equipment. We used ⅝-in. stock, and upset it at one end to the required diameter.

WE ELIMINATED AN EXPENSIVE OPERATION

Bethlehem fasteners engineers bypassed a costly and exacting operation for this forged steel plate. When the customer drilled the part, he had to position the bit precisely for every hole. The suggestion, to forge "starter holes" right into the part, is an example of how our designers are constantly on the alert to create cost-saving improvements.

OUR EQUIPMENT CAN DO IT!

All four of our modern fasteners plants have the facilities to make specialty products to your drawings and specifications . . . to meet your special requirements: upset (hot or cold), forged, formed, machined, punched, threaded, coated or uncoated.

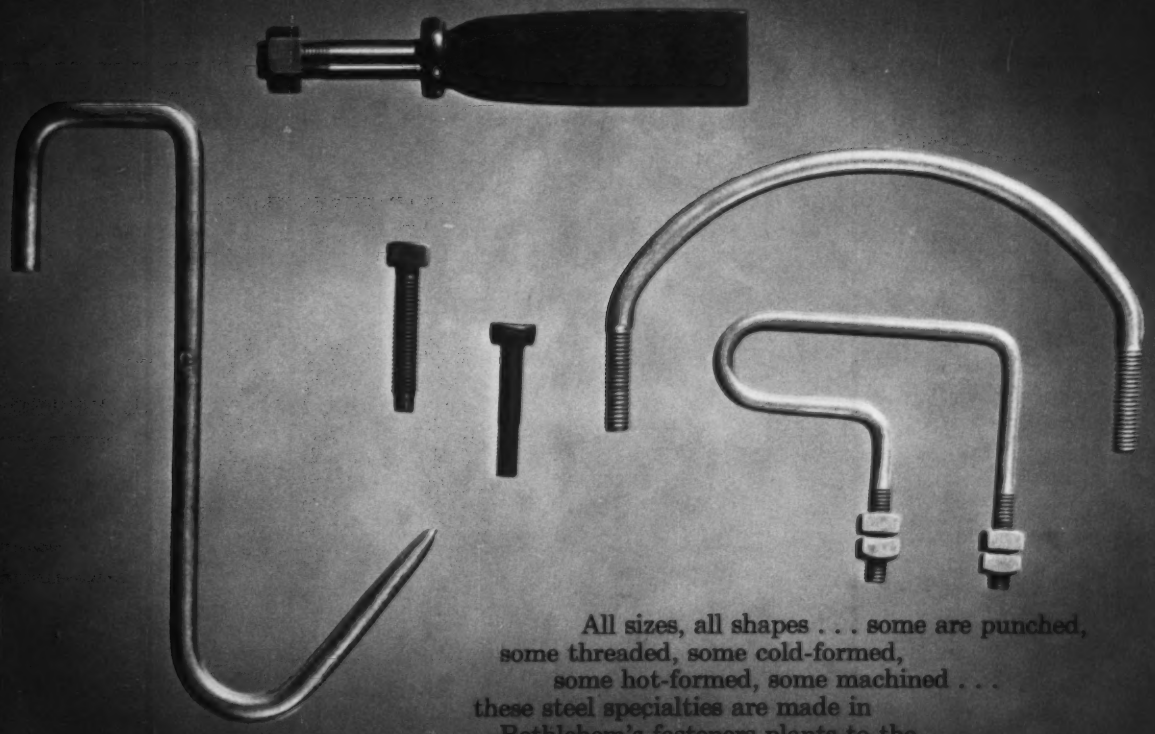
redesigned these cost-saving "specials"

Would you like a Bethlehem fasteners engineer to help solve your problems? He's at your service. Just send us a sample of the part you are now using, or a drawing or pencil sketch of what you have in mind. A complete description of the end use will help us to give you the best possible results.

BETHLEHEM STEEL

BETHLEHEM STEEL

look at this wide range of steel specialties



All sizes, all shapes . . . some are punched, some threaded, some cold-formed, some hot-formed, some machined . . . these steel specialties are made in Bethlehem's fasteners plants to the most exacting customer specifications.

Here's a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:
Carbon and alloy AISI grades
Concrete reinforcing bars
Leaded steels
Special rolled sections

TOOL STEELS:
Water, oil, and air-hardening grades

FORGINGS:
Drop, press, hammer, and upsetter
Rolled-and-forged sections

ROD AND WIRE:
Hot-rolled rods, wire, and wire products

SHEETS:
Hot- and cold-rolled
Continuously galvanized
Enameling sheets

TIN MILL PRODUCTS:
Electrolytic and hot-dip tinplate; blackplate

PLATES:
Universal and sheared
Flanged and dished heads

WIRE ROPE AND SLINGS

FASTENERS:
Bolts, cap screws, rivets
Special fasteners

STEEL PIPE:
Continuous butt-weld
Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

WELDMENTS:
Frames, tanks, housings, vessels

FREIGHT CARS, PARTS, WHEELS, AXLES

RAILS:
Tee, crane, girder

CASTINGS:
Carbon, alloy, stainless steel
Iron, brass, bronze

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Union Vote

Sir—I fully realize that in writing this letter I am opening the floodgates of calumny, a new torrent of falsehoods, and a more vicious campaign of trials against myself. But a rebellion is storming inside of me.

One look at the official ballot of the United Steelworkers of America election this month is to be convinced that this election is sterile. No one in his right mind can say that the rank and file can exercise their right to vote. Not where there is but one candidate for each office on the ballot. And that one candidate is an incumbent of that office.

Do the incumbent international and district officers fear facing opposition? They most certainly do! The Steelworkers' constitution provides one set of rules regulating election procedures for local union office, but provides an entirely different and undemocratic set of rules dealing with international and district offices. By the use of undemocratic tactics, the incumbent officers can disqualify the opposition and perpetuate themselves in office from here to eternity.

Every Steelworker has the right to be a candidate. To be truly democratic, every effort must be exerted to make it easier for Steelworkers to get on the ballot. The right to run for office, the right to be a candidate, and the right to vote for the candidate of one's choice have all been declared "property rights" by the courts of this land.—Nicholas Mamula, president, USW Local 1211, Aliquippa, Pa.

Ranks Highest

Sir—I have read a lot of resumes about President Kennedy, some quite lengthy and others brief, and without flattery your editorial of Feb. 2 ("State of the Nation: Youth Plots Its Course!") in my estimation, ranks highest. Being on the upper limit of middle age I, naturally, must have some misgiving. But we still know here in America in the final analysis the results will be according to the composite of the people. — B. R. Reuscher, St. Marys, Pa.

Again?

Sir—In the January 28, 1960 issue of The IRON AGE you published an article entitled "Steel Capacity by Companies and Types." This information was received from the American Iron & Steel Institute.

We would like to know if you intend to publish such an article again this year. If it has already been published and we neglected to see it, we would appreciate receiving reprints.—Grant F. Neely, vice president, Vulcan Mold & Iron Co., Latrobe, Pa.

▪ **Unfortunately, the American Iron & Steel Institute had decided to cease issuing steel capacity figures in any way, shape or form. Therefore, this annual article has become a casualty of the steel capacity hassle.—Ed.**

"You asked to see me, Broderick. Now take a good look and get back to work!"

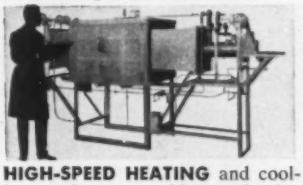
Ed Johnson, Furnace Application Engineer, talks about

SINTERING CERMETS

Whether you're working with cermets, ceramics, refractory metals, or stainless steel powder compacts, Hayes has the *right* furnace and the *right* atmosphere to give you best results at lowest cost.

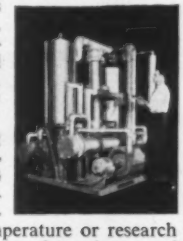
PRECISE SINTERING TEMPERATURES are important for effective bonding of compacts. The Hayes Type M-Y High-Temperature Furnace provides the exact, uniform heating required — has straight-through design for easy operation.

ECONOMICAL, TOO, the Hayes Type M-Y furnace needs only modest power input for temperatures to 3300°F with Moly elements. It can be used with reducing atmospheres for close control research or full-scale production, and is available with metallic or ceramic superhearths.



HIGH-SPEED HEATING and cooling cycles mean big production with the Hayes Model HT/HV Vacuum Furnace. A full-production size vacuum furnace, this Hayes unit is cold-wall designed for compactness as well as operating comfort. Heat-up to 3000°F range and over in minutes, with low voltage elements. High vacuum to 0.1 micron . . . low leak rate.

THE RIGHT ATMOSPHERE is available from the complete Hayes line —ammonia dissociators, endo and exo generators, nitrogen and forming gas generators, gas dryers — all designed for controlled, dependable operation.



WHATEVER YOUR SINTERING PROBLEM — for production, high temperature or research sintering, Hayes know-how and equipment can supply you with a Results Guaranteed answer . . . tested in our lab on shop-scale equipment, and proved by scores of similar installations in industry. Write for bulletins on Hayes sintering furnaces. C. I. Hayes, Inc., 821 Wellington Ave., Cranston 10, R.I.

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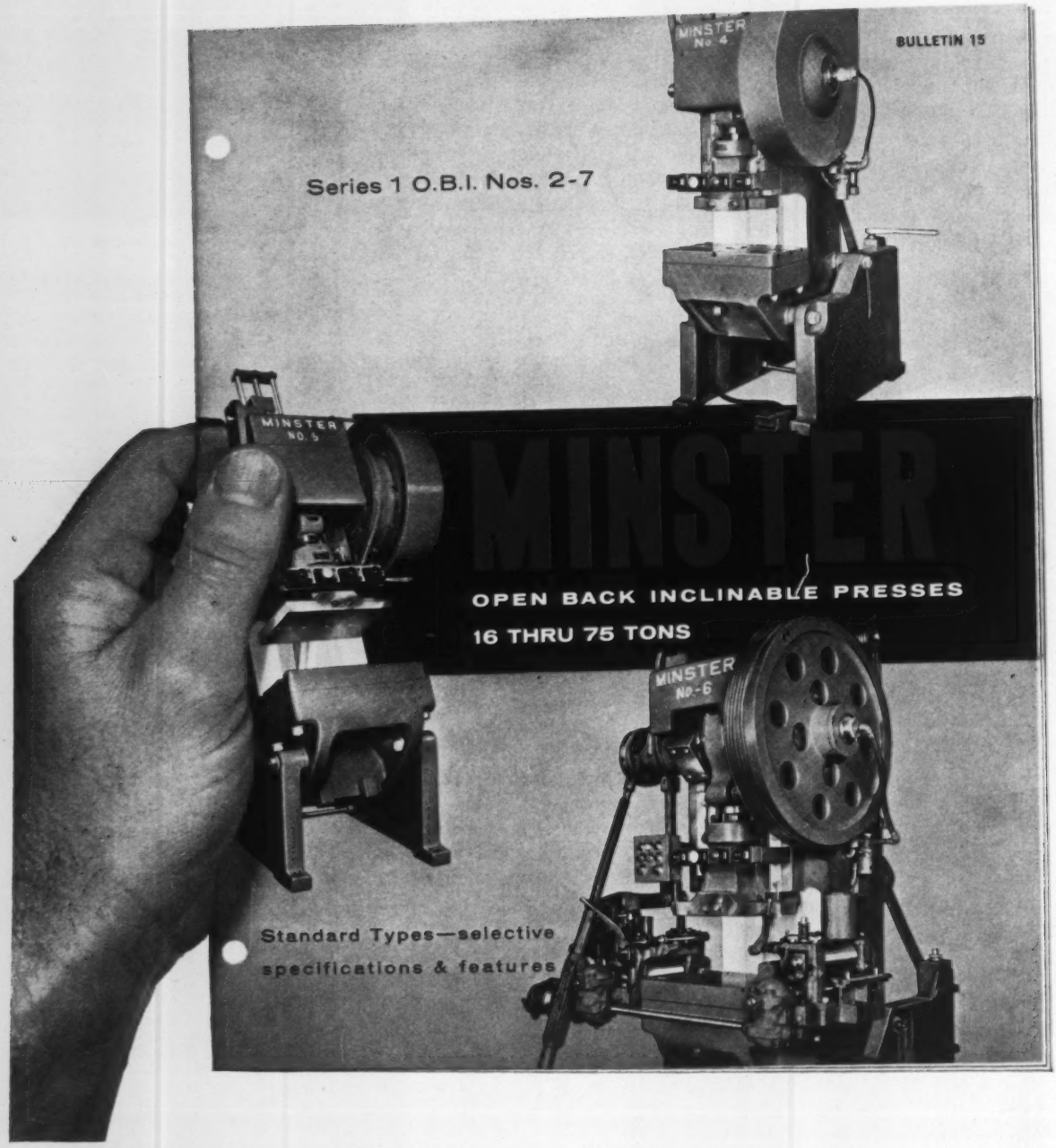


The "Hidden Strengths and Values" of Minster O.B.I. presses . . . points of superiority that only Minster offers the O.B.I. user . . . are outlined in this new Bulletin 15. It will help you make comparisons when next you buy an O.B.I. May we send you a copy? Write or call . . .

The Minster Machine Company, Minster, Ohio

How Was That Again?

Keeping IRON AGE readers up-to-date on economic trends is an important part of our job.

In our weekly Business Forecast (see p. 7), we try to interpret business news in clearly written, brief items. That's why we were amused by the following roundabout descriptions of business trends. They originally were prepared by Scriptomatic, Inc.—to be taken without a grain of salt.

"Business Forecast—Sales and income figures show an easing up of the rate at which business is easing off. This is taken as proof of the government's contention that there is a slowing up of the slowdown.

"In order to clarify the cautious terminology of the experts, it should be noted that a slowing up of the slowdown is not as good as an upturn in the downturn, but it's a good deal better than either a speed-up of the slowdown or a deepening of the downturn, and does suggest that the climate is about right for an adjustment to the readjustment."

Thoughts on Jobs—After you absorb that one, how about this analysis of unemployment:

"We find a definite decrease in the rate of increase, which clearly shows there is a letting up of the letdown. Of course, if the slowdown should speed up, the decrease in the rate of increase of unemployment would turn into an increase in the rate of decrease of employment. In other words, the deceleration would be accelerated."

Keep Them Happy

Making sure secretaries stay happy isn't easy. But, according to the Lipton News, the boss is often at fault.

To find out how you look to your secretary, give your answers to these questions:

Are you the dawdler who starts dictating late and constantly makes second-thought changes, so that every letter has to be rewritten?

Plan Ahead—Do you have your material organized before you start dictating? Failing that, do you take out your irritations on her, implying that everything is her fault?

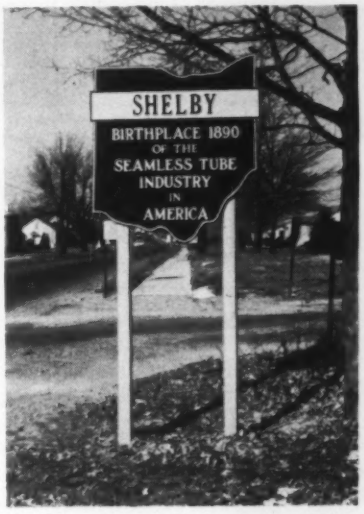
Do you mumble, swallow your words, retrace your sentences until the syntax resembles a Chinese laundry ticket—then accuse her of not getting it right?

When you go out, do you tell her where you can be reached, or do you expect her to be a mind reader?

Do you train your secretary in the rudiments of your job so that she can be of more assistance to you?

Seamless Birthplace

The highway sign shown below is one of several noting that Shelby, Ohio, is the birthplace of the seamless tube industry in America. Markers, put up by the Historical



Markers Committee of the Ohio Historical Society, are placed on each state route entering the city. Site where the first seamless tube plant was built in 1890 now contains mills of the Ohio Seamless Tube Div. of Copperweld Steel Co.

Ohio Seamless was formed shortly after fire destroyed the original mill.

FURNACES
TO HEAT TREAT OR SHAPE METALS MORE EFFICIENTLY
CAR HEARTH FURNACES
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Write for technical data and catalogs on the above and many other R-S Furnaces to . . .
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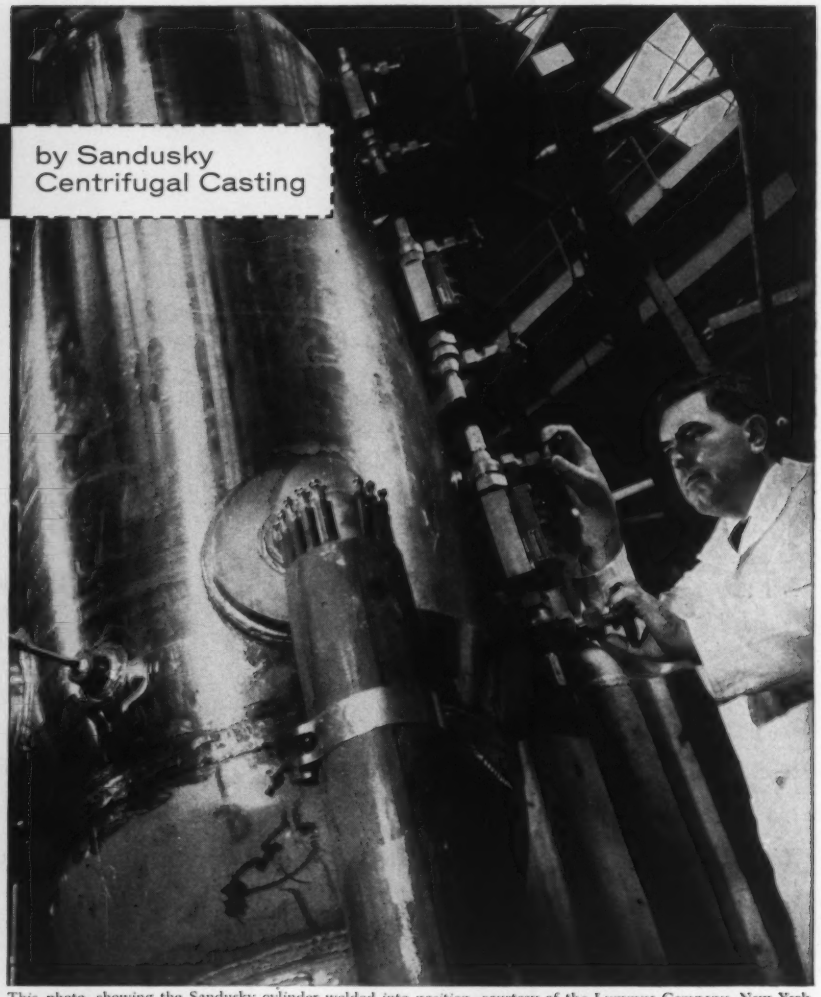
FURNACES

SOLVED: by Sandusky Centrifugal Casting



This photo, showing the Sandusky cylinder welded into position, courtesy of the Lummus Company, New York. New York who fabricated, assembled and tested the completed loop before shipping it to the ETR site in Idaho.

Nuclear Test Loop Uses Sandusky Centrifugal Casting as Pressurizer Cylinder

A Sandusky Centrifugal Casting is the main cylindrical component of an electrically heated pressurizer, designed by Knolls Atomic Power Laboratory to Section VIII, of the ASME Code (Unfired Pressure Vessels) for use in the new Engineering Test Reactor facilities at Idaho Falls, Idaho.

This 66¼" long cylinder, 27" O.D. with walls 2½" thick, was centrifugally cast of an 18-8 stainless steel (SA-351, Grade CF-8) for the extra corrosion resistance required under nuclear loop service conditions: demineralized water at temperatures to 650°F and pressures to 2500 PSI.

O. G. Kelley Co., Boston, to whom we delivered this 2-ton, fully machined cylinder, welded on the forged heads and nozzles, radiographed the welds, and hydro tested the completed vessel to 4300 PSI.

This is another example of the adaptability of Sandusky Centrifugal Castings to applications demanding the highest order of quality. They may well offer you a practical and economical answer to your cylindrical needs, also.

We are producing cylinders and piping in diameters from 7" to 54"—in lengths to 33 ft.—in a wide range of ferrous and non-ferrous alloys. Write for Bulletin 300, for more complete technical information on the Sandusky process and product application data.

SANDUSKY CENTRIFUGAL CASTINGS
FOUNDRY & MACHINE CO.

SANDUSKY, OHIO—Stainless, Carbon, Low-Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys

9903

COMING EXHIBITS

Western Metal Show — March 20-24, Pan Pacific Auditorium, Los Angeles. (American Society for Metals, Metals Park, Novelty, O.)

National Packaging Show — April 10-13, Lakefront Exposition Hall, Chicago. (American Management Assn., 1515 Broadway, Times Square, New York 36.)

Welding Show — April 17-21, New York Coliseum, New York. (The American Welding Society, 33 West 39th St., New York 18.)

Powder Metallurgy Show — April 24-26, Hotel Sheraton - Cleveland, Cleveland. (Metal Powder Industries Federation, 60 E. 42nd St., New York.)

Castings Show—May 8-12, Brooks Hall, San Francisco, Calif. (American Foundrymen's Society Golf & Wolf Rds., Des Plaines, Ill.)

Design Enginering Show — May 22-25, Cobo Hall, Detroit. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

MEETINGS

FEBRUARY

The Metallurgical Society of AIME —Annual meeting, Feb. 26-Mar. 2, Ambassador and Chase-Park-Plaza Hotels, St. Louis. Society headquarters, 29 West 39th St., New York.

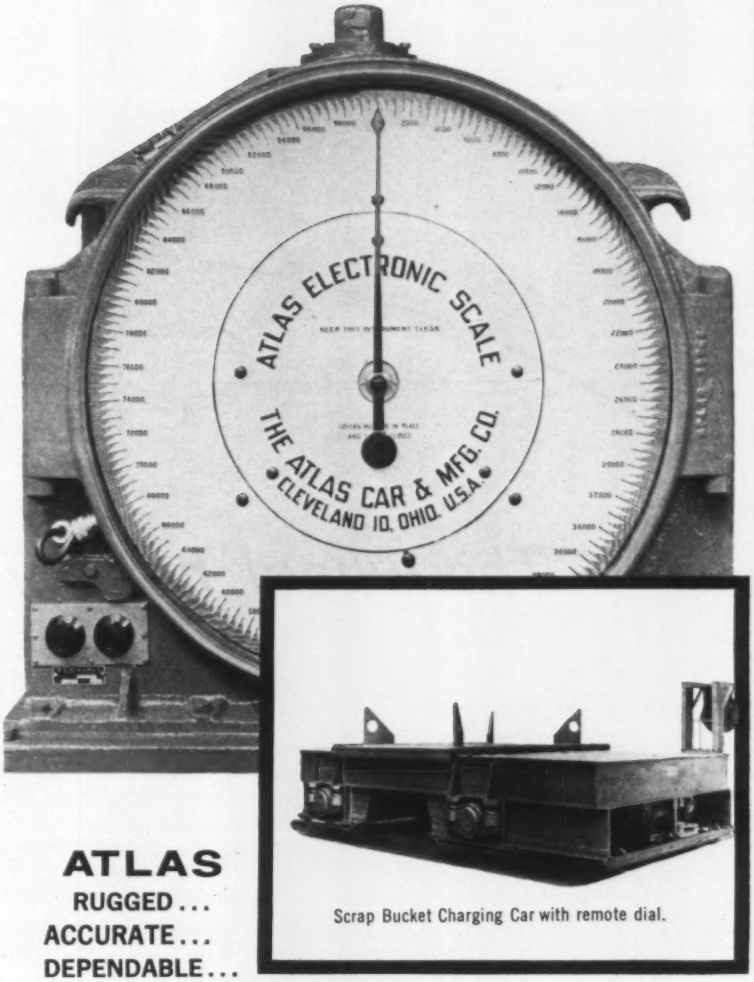
Assn. of Iron & Steel Engineers—Western meeting, Feb. 27-Mar. 1, Hotel Statler, Los Angeles. Association headquarters, 1010 Empire Bldg., Pittsburgh.

MARCH

Malleable Founders Society—Technical and Operating conference, Mar. 1-2, Pick-Carter Hotel, Cleveland. Society headquarters, 781 Union Commerce Bldg., Cleveland.

Can Manufacturers Institute, Inc.—Annual & Board meeting, Mar. 6, Waldorf-Astoria, New York. Institute headquarters, 821 15th St., N. W., Washington, D. C.

(Continued on P. 28)



Scrap Bucket Charging Car with remote dial.

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ACCURATE...
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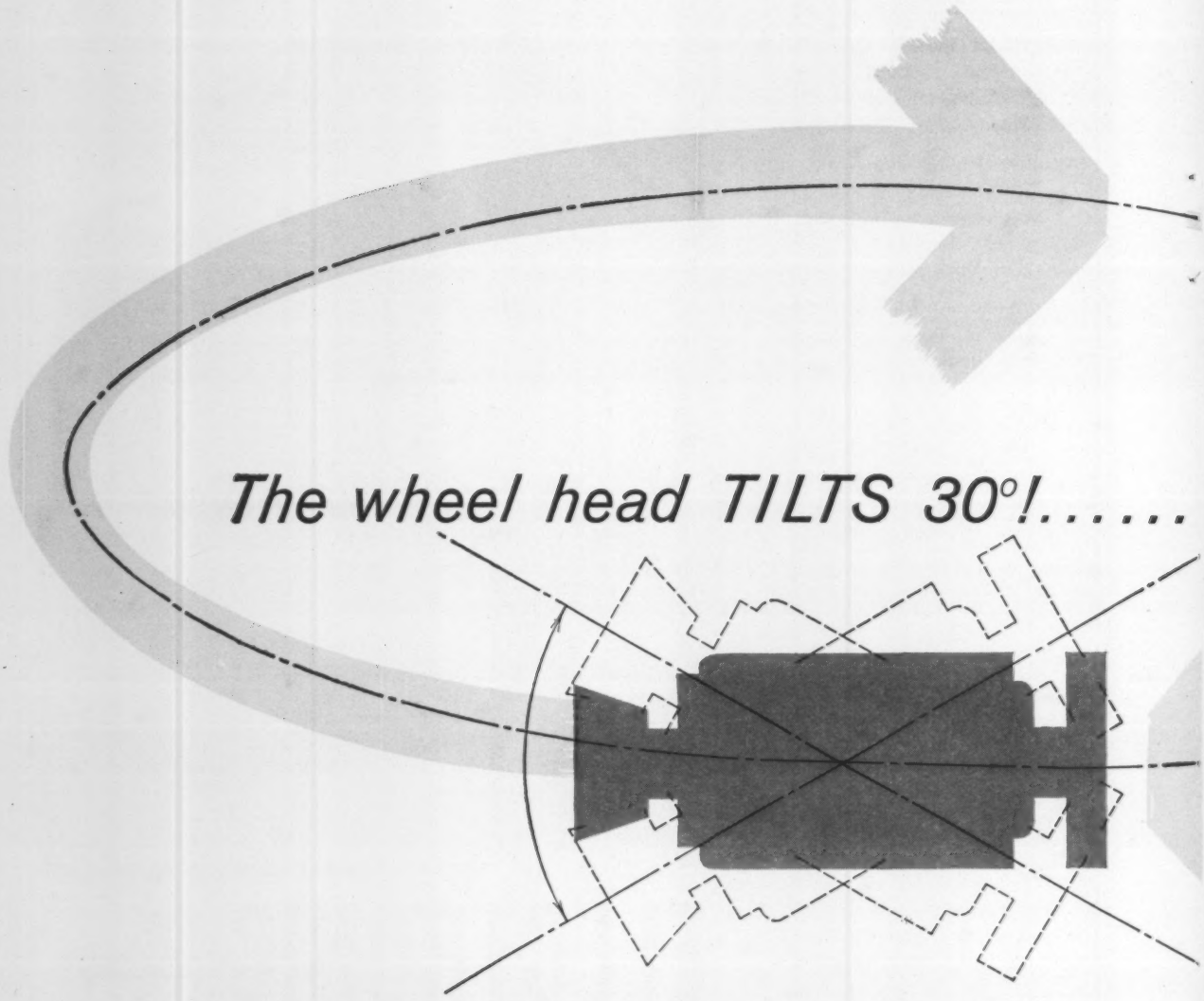
ELECTRONIC DIAL SCALES

Atlas Electronic Scales have the accuracy and ruggedness which makes them suitable for the heaviest service. They are credited with being the most simple of any electronic scale on the market.

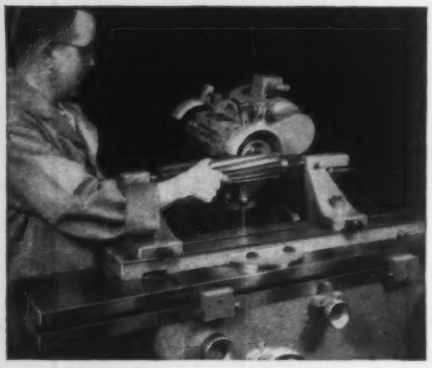
A special feature is that many of the parts of the Atlas Electronic Dials are interchangeable with Atlas Mechanical Scales, which have earned an outstanding position in heavy-duty weighing service.

ATLAS CAR & MFG. CO.

1100 IVANHOE ROAD **CLEVELAND 10, OHIO**



The NEW NORTON No. 200 Cutter and Tool Grinder makes setups simpler . . . easier . . . quicker!



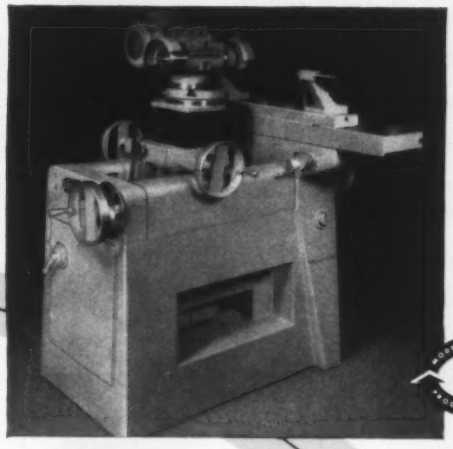
Tool room men can tell you that grinding a taper reamer is one of their toughest jobs. But now they're discovering that it and other tough tool grinding jobs are a "snap" with the new Norton No. 200. Because:

You can tilt the wheel head up to 15° above or below horizontal — and swivel it through a full orbit of 360°.

And the table has a very rugged, extremely accurate guide bar, which assures precision in tracking, during the most difficult grinding jobs.

All this means no more time-wasting "cut and try" tactics . . . no more wrestling with tricky setups . . . a wheel head scale provides quick direct readings of clearance angles . . . for practically all grinding on centers, the

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



MMT-PE

ORBITS 360°!

tooth rest can be kept on the center-line of the cutter, eliminating time losses from additional settings . . . the table design enables use of gage blocks for quick taper grinding setups and fast return of table to straight setting . . . greater wheel head capacity through eccentric mounting simplifies approach to many special jobs.

In addition:

The No. 200's extremely solid grinding action brings you excellent finish on tool cutting edges, with resulting benefits in tool life and performance. That's because the No. 200 is a wheel slide type machine, where grinding is always within the area of the rigid base, with no instability due to work overhang. Other advanced features include: quick-change two-speed wheel drive; centrally located column controls, wheel slide dials readable from any position.

Your Norton Man, a trained grinding engineer, will be glad to show you how the new Norton No. 200 cutter and tool grinder can help you modernize and economize in your plant. For catalog #1371, write to NORTON COMPANY, Machine Division, Worcester 6, Mass. *District Offices:* Worcester, Hartford, Cleveland, Chicago, Detroit. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.

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MACHINE TOOLS

75 years of . . . Making better products

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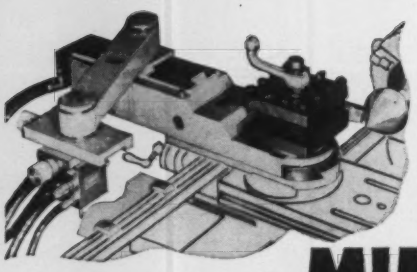
MACHINE TOOL DIVISION: Grinding and Lapping Machines — **G & E DIVISION:** Shapers • Gear Cutting Machines • Gear Induction Hardeners

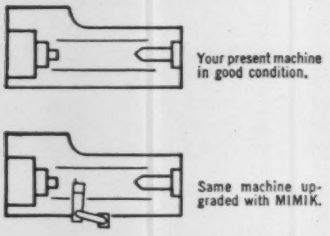


Consider: THE SIMPLE ECONOMICS OF the MIMIK® METHOD

Improved production facilities cost money. The big questions are where? when? and how much? See how the Mimik Hydraulic Tracer provides the degree of flexibility, low capital and operating costs and high precision quality control needed to keep ahead in machining work today.

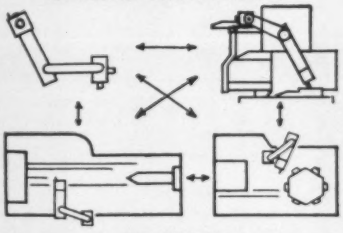
Basic Economics of **MIMIK TRACERS**

1 LOWER CAPITAL COSTS



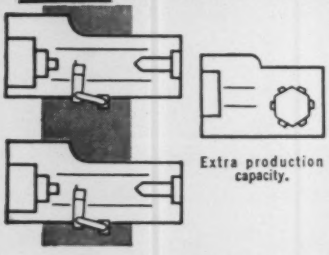
Maximum output with minimum outlay is obtained by the MIMIK METHOD.

2 STILL LOWER CAPITAL INVESTMENT



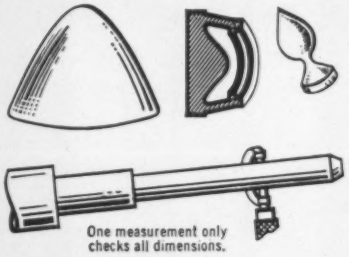
One versatile MIMIK Tracer can serve three machines of same general size because the MIMIK is completely interchangeable within minutes.

3 MORE PRODUCTION REDUCED OPERATING COSTS



Two machines equipped with MIMIK Tracers will free your third machine for bonus production.

4 GREATER RANGE OF WORK



No limitation to work-piece contour or size with MIMIK. Strict accuracy of MIMIK action ensures constant repetition.

Modernize with the MIMIK METHOD. A thorough study of your machinery requirements by Mimik-trained specialists will show how the truly interchangeable MIMIK Tracer can create the flexibility that today's production schedules need.

Ask our Mimik-man to discuss the MIMIK METHOD with your production team. He has a wealth of experience and information at his finger tips.

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MIMIK TRACERS INC., Buffalo, N.Y.
EAST: Mimik Tracers Inc., 3901 Union Rd., Buffalo, N.Y.
CENTRAL: Bartsch Tool Corp., 3714 Oakton St., Skokie, Ill.
WEST COAST: Allied Pacific Manufacturing Co., Compton, Cal.
CANADA: Retor Developments Ltd., Galt, Ontario

Mimik-men are everywhere

MEETINGS

(Continued from P. 25)

Steel Founders' Society of America —Annual meeting, Mar. 11 - 14, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland.

Industrial Diamond Assn. of America, Inc.—Annual meeting and convention, Mar. 13-17, Hollywood Beach Hotel, Hollywood, Fla. Association headquarters, Box 175, Pompton Plains, N. J.

Society for Non-Destructive Testing — Western regional convention, Mar. 20-24, Ambassador Hotel, Los Angeles. Society headquarters, 1109 Hinman St., Evanston, Ill.

American Hot Dip Galvanizers Assn., Inc.—Annual meeting, Mar. 22-24, The Royal Orleans, New Orleans. Association headquarters, 5225 Manning Place, N. W., Washington, D. C.

Pressed Metal Institute — Spring technical meeting, Mar. 22-24, New York. Institute headquarters, 3673 Lee Rd., Cleveland.

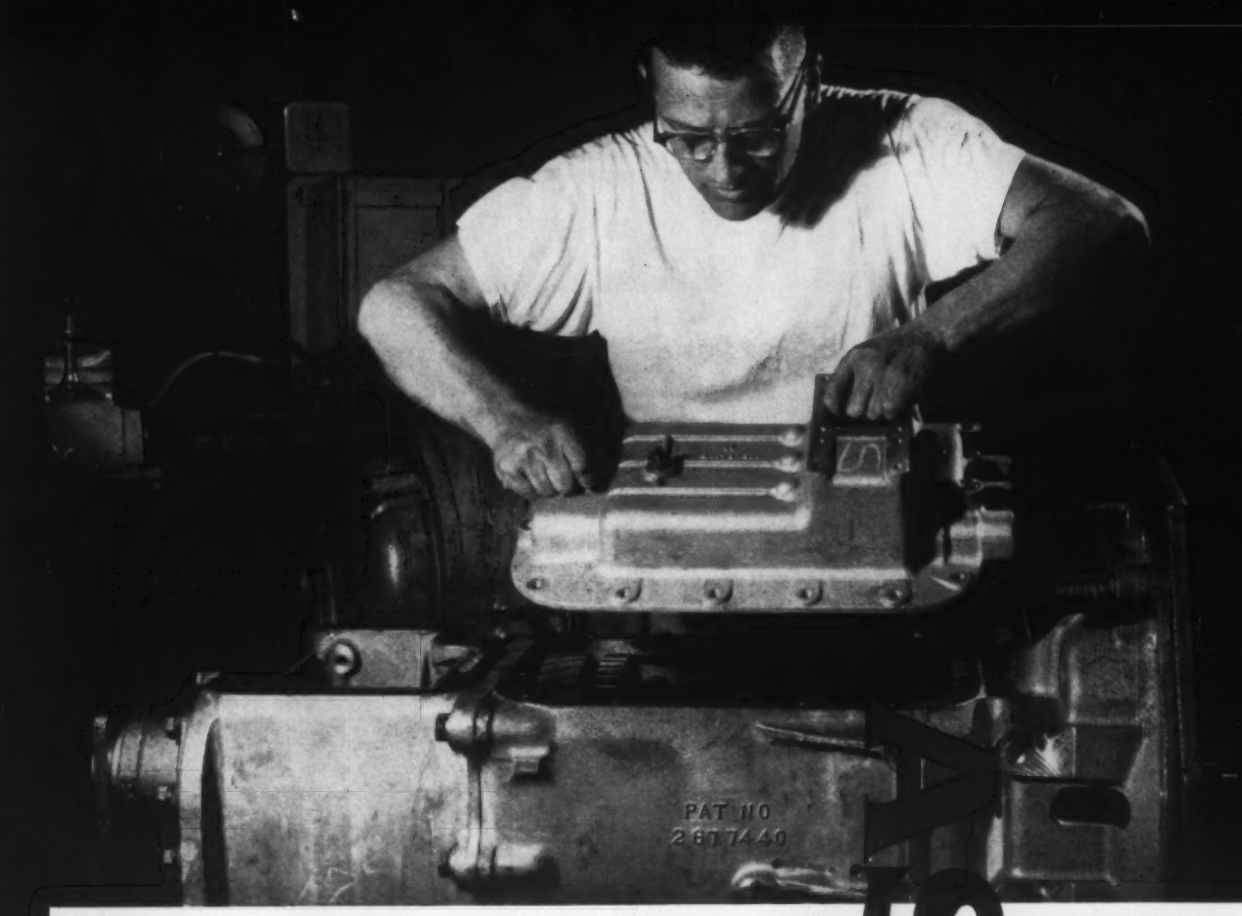
Air Moving and Conditioning Assn., Inc.—Mid-year meeting, Mar. 22-24, Whittier Hotel, Detroit, Association headquarters, 2159 Guardian Bldg., Detroit.

American Machine Tool Distributors Assn. — Spring meeting, Mar. 23-25, Hotel Mark Hopkins, San Francisco. Association headquarters, 1500 Massachusetts Ave., N. W., Washington, D. C.

APRIL

The Metallurgical Society of AIME —National Openhearth Steel Conference, Apr. 10-12, Sheraton Hotel, Philadelphia. Society headquarters, 29 West 39th St., New York.

Steel Shipping Container Institute, Inc.—Annual meeting, Apr. 11-13, Kenilworth Hotel, Miami Beach, Fla. Institute headquarters, 600 Fifth Ave., New York.



This transmission shift housing is one of several truck engine parts now cast of Tenzaloy for high strength without weight.

High strength aluminum castings without heat treatment:

TENZALOY
THE SELF-AGING ALUMINUM ALLOY

Tenzaloy is a corrosion resistant aluminum alloy that ages at room temperatures, delivers high strength properties without costly solution treating, quenching, and artificial aging. No special foundry techniques are required; no fluxes. Castability is excellent with sand cast and plaster molds, and many permanent molds. Tenzaloy castings have superior machinability, take a brilliant polish, anodize clear white. Write for TENZALOY Bulletin No. 103 to: Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y., or call your nearest Federated sales office.

ASARCO

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FEDERATED METALS DIVISION

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MINNEAPOLIS, MINN.
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IN CANADA: Federated Metals Canada, Ltd.
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GOODYEAR

NEWS! ONLY V-BELTS BY GOODYEAR

to give you sets matched in length to pull together

What's more, Green Seal V-Belts give you—

True dimensional stability for the life of the belt—built in through the use of shrink- and stretch-resistant 3-T Process Cord or airplane-type steel cable.

Mildew-inhibited construction for protection in damp operating conditions.

Widest selection from the most complete V-belt line anywhere.

Ready availability from distributor stocks in every part of the country.

Technical assistance whenever it's needed from a qualified expert, the G.T.M.—Goodyear Technical Man.

For the best buy in V-belts call your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

Lots of good things come from GOOD

GREEN SEAL ARE CODED TO 1/32"...

perfectly for longer, more trouble-free service

LENGTH-CODING GREEN SEAL V-BELTS TO 1/32"—NOT JUST 1/10", LIKE MOST BELTS—takes this ultra-precision machine. Only Goodyear has this type equipment, which is set by means of fine tolerance steel templates to insure accuracy. Machine readings are in the actual code numbers used to eliminate errors.

Green Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

YEAR INDUSTRIAL PRODUCTS

New... from VAN HUFFEL

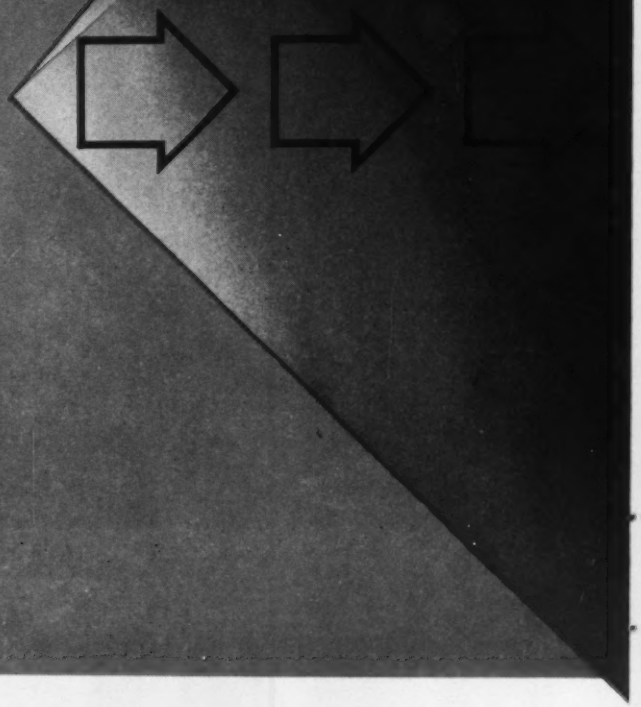
COLD FORMED CONTINUOUS

SINGLE WELD

STEEL TUBING IN RECTANGLES AND SQUARES IN SIZES THIS

BIG

FOR INDUSTRIAL AND ARCHITECTURAL APPLICATIONS



Steel

WHERE **BIG** IDEAS TAKE SHAPE IN METAL

APPLICATIONS

Because of its high production potential and adaptability, the uses of Van Huffel square and rectangular tubing are practically unlimited. Here are a few:

- Structural Columns
- Sign Supports
- Canopy Supports
- Beams
- Steel Buildings
- Farm Equipment
- Earth Moving Equipment
- Bridge Work
- Automobile Transports
- Storage Racks
- Guard Rails

ACTUAL SIZE
6" x 6" .259 WALL

ADVANTAGES

MORE STRENGTH
Roller Die, cold formed continuous welding *on one side ONLY* provides maximum strength throughout.

GREATER SAVINGS
High strength-to-weight ratio permits use of lighter gauges or smaller sizes than solid metals.

UNIFORMITY
Uniform wall thickness, square sides, accurate radii and straightness.

FUNCTIONAL BEAUTY
Smooth finish, free of scale and protruding flash, ready to paint.

STANDARD SIZES AND GAUGES

Squares:
5" x 5" — .165" to .259 wall
6" x 6" — .165" to .259 wall

Rectangles:
4" x 6" — .165" to .259 wall
4" x 8" — .165" to .259 wall

in any lengths and all common grades of steel.

ACTUAL SIZE: 4" x 8" .259 WALL

Van Huffel also produces this wide range of standard welded sizes and gauges:

ROUND—⅛" through 6" in gauges from .020 (25 ga.) through .259 (3 ga.) and all intermediate sizes.

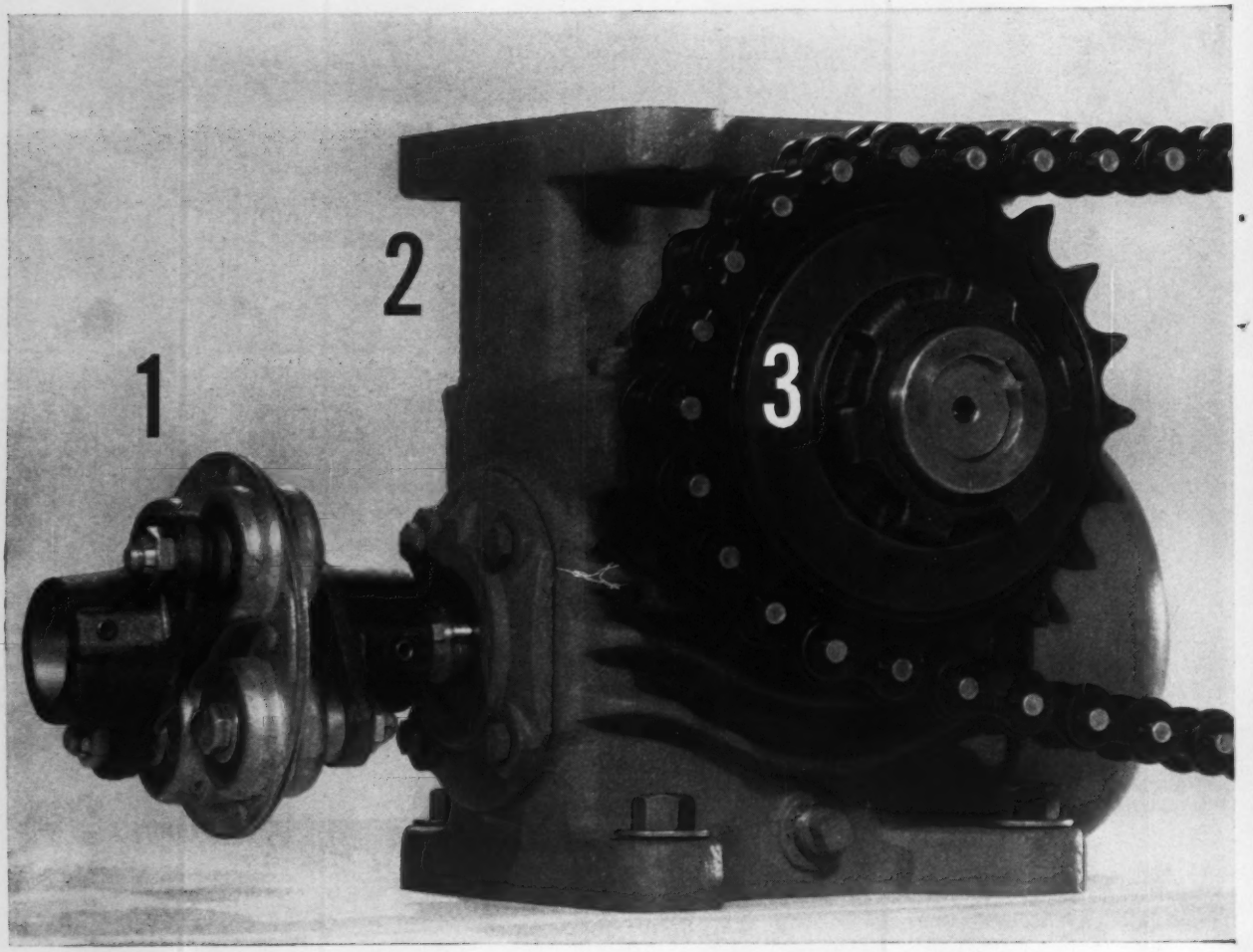
SQUARE—⅛" through 6" in gauges from .020 (25 ga.) through .259 (3 ga.) and all intermediate sizes.

RECTANGULAR—⅜" by ⅛" through 4" by 8" in gauges from .020 (25 ga.) through .259 (3 ga.) and all intermediate sizes.

All Van Huffel Welded Tubing stocks are available through Steel service centers in principal cities.

WRITE FOR FREE
48 page handbook

VAN HUFFEL
TUBE CORPORATION • WARREN, OHIO



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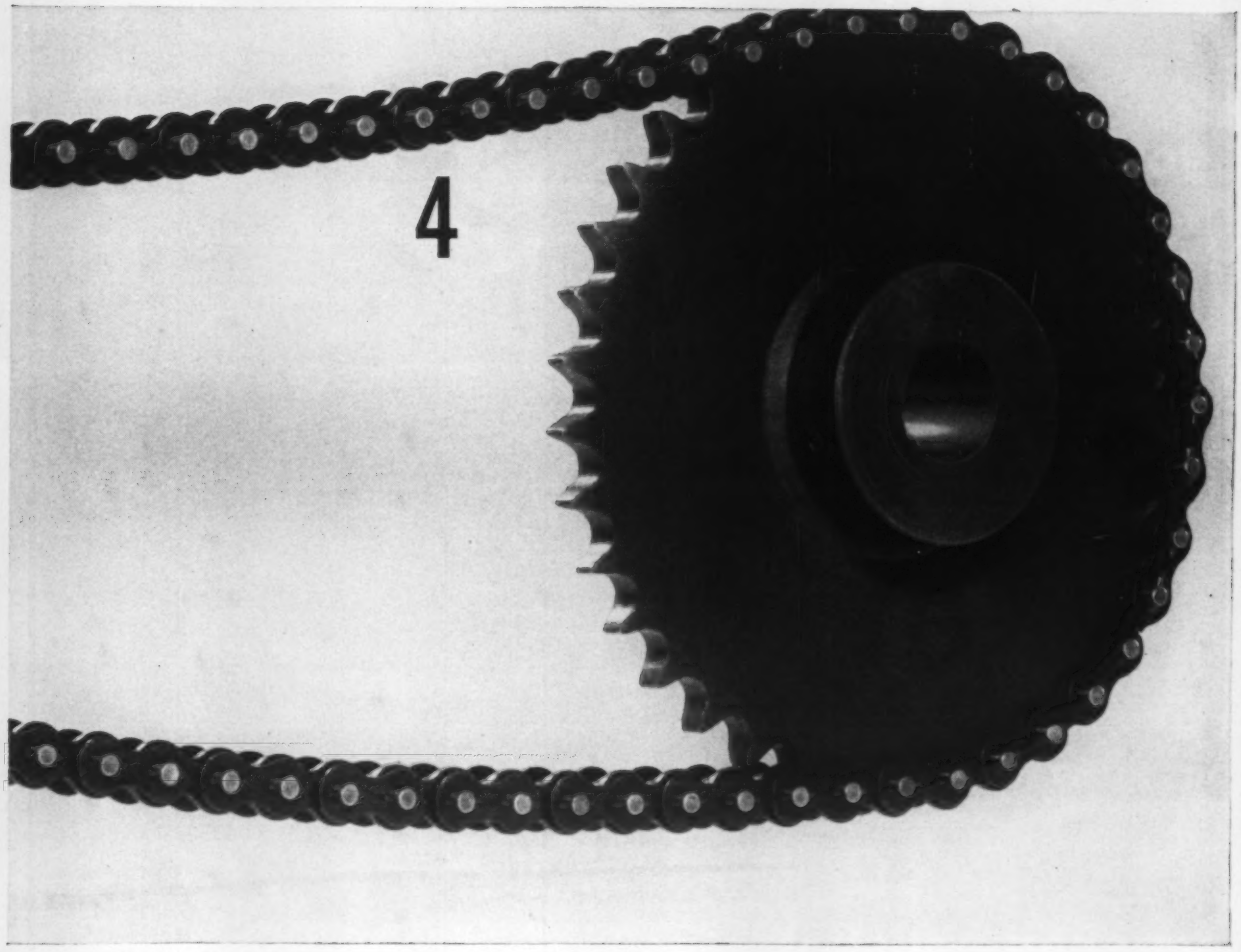
1 Couplings and Driveshafts	2 Eberhardt-Denver Speed Reducers	3 Clutches	4 Chain and "Timing" Belt Drives
Morflex	PoweRgear®	Torque Limiter	Roller Chain
Flexible Chain	Worm Gear	Cam	Silent Chain
Radial	Helical	Overcenter	Hy-Vo® Drives
Nylon	Gearmotors	Pullmore	"Timing"® Belt



power transmission needs because only Morse offers transmission components

REMEMBER: The toughest jobs in power transmission come to Morse, because *only Morse* offers one-source service on all four of these basic components . . . and backs them up with technical know-how based on over 60 years' experience solving power transmission problems.

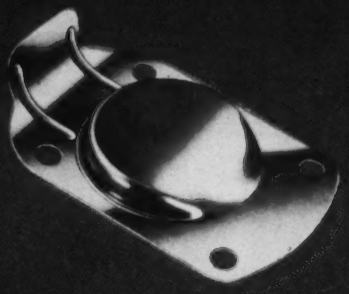
MORSE

A BORG-WARNER INDUSTRY

BW

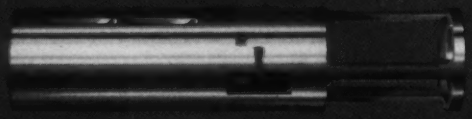
Look for your local Morse distributor in the Yellow Pages under "Power Transmissions", or write:
MORSE CHAIN COMPANY, Dept. 33-21, ITHACA, NEW YORK. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ontario

you can blank it...



you can forge it...

you can polish it...



but you can never, no never, change its **consistent uniformity!**

...and that means maximum production, accurate conformity to specifications, fewer rejects and increased profits with **Carpenter Specialty Stainless** ...produced by one of the leaders of stainless steels for industry.

Carpenter steel

you can do it ***consistently*** better with Carpenter Stainless Steels for specialists

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

How to pick the right rust preventive

Rust and corrosion of metal parts during manufacture and in storage cost industry millions of dollars every year. Yet this need not be. A simple application of a rust preventive can save untold dollars.

One of the common fallacies that result in rusted or corroded metals is that "any oil" will do. In most cases it will—for a while. But "any oil" is not an effective protector of metal. The formulation of a quality grade of rust preventive is the result of intensive laboratory testing.

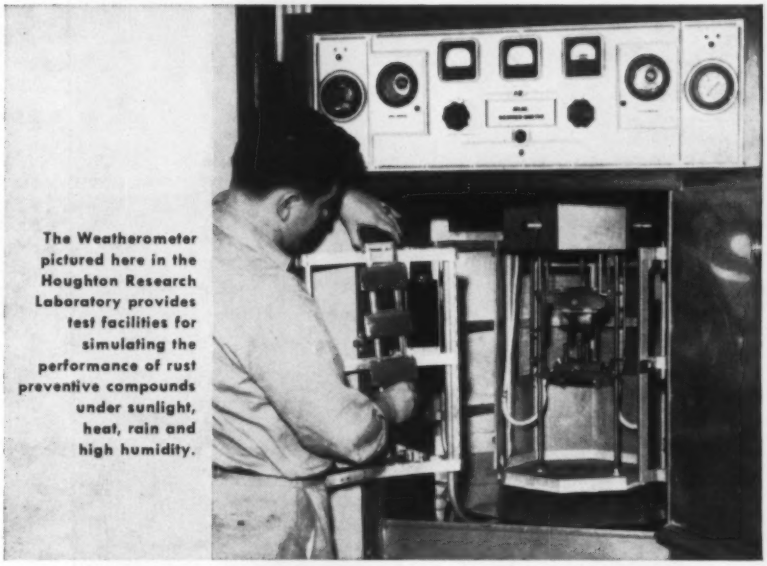
Often a rust preventive must do more than protect against moisture. Sometimes it must be "polar active"—have an affinity for metal that is strong enough to cause it to creep under water on a metal surface and actually raise the water off the surface.

Other Considerations

In certain applications resistance against oxidation is another required property. When oxidation occurs, corrosive materials are formed which attack the metal.

Another consideration is what is to be done with the part which has been protected. If it is to be plated or painted, an easily removed coating is necessary. If it is to be shipped overseas, the coating must withstand salt spray and wide variations in temperature and humidity. If the part or machine is to be exposed to weather—outdoor storage—it must resist the mechanical battering of wind and rain, and the effect of sunlight and variations in temperature.

These are some of the basic considerations involved in picking the right rust preventive for the job. Houghton has been compounding rust preventives since 1869. The familiar name "*Cosmoline*" was introduced by Houghton and is still used to designate government specification rust preventives. "*Rust Veto*" is Houghton's name for its industrial protective coatings.



The Weatherometer pictured here in the Houghton Research Laboratory provides test facilities for simulating the performance of rust preventive compounds under sunlight, heat, rain and high humidity.

Below is a bare outline of facts required in order to determine the right rust preventive for any metal, under any conditions of exposure, which will result in adequate protection at lowest cost.

Among the items which may be required to choose the right rust preventive are the following:

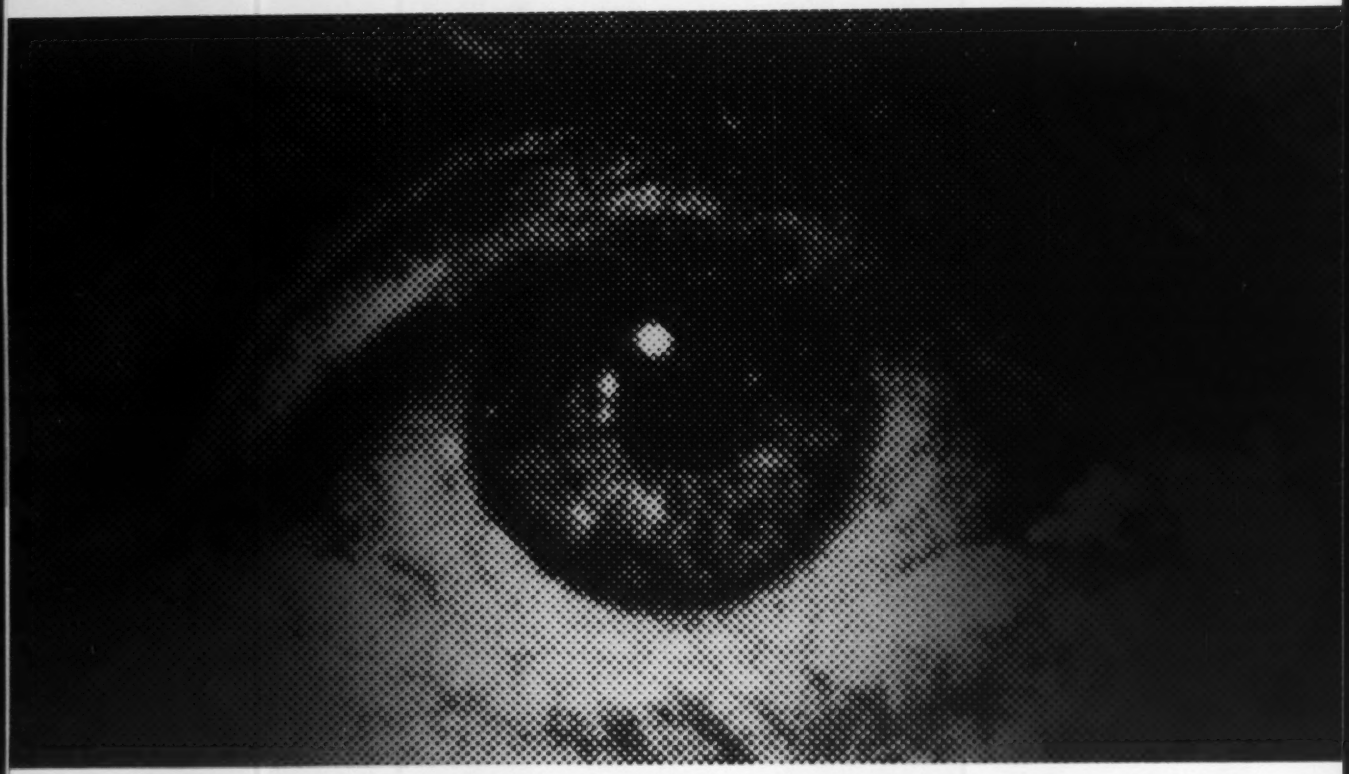
- **Metal to be protected**
- **Type of surface finish**
- **Possible contamination of surfaces**
- **Previous cleaning procedure**
- **Storage conditions**
- **Type of film desired**
- **Fire hazard, if any**
- **Need for removability**

The Houghton Man has a complete questionnaire form for determining the type of rust preventive best fitted for a particular need. Ask him for a copy to be used as a guide in requesting a recommendation. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Houghton

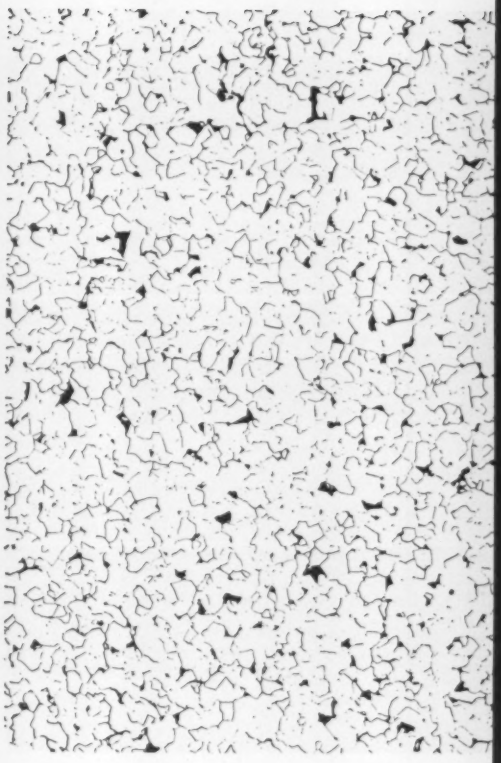
INDUSTRY'S PARTNER IN PRODUCTION

This mark tells you a product is made of modern, dependable Steel.



What you see can't hurt you—At the right is a section of USS National Electric Welded Tubing magnified 100 times with a metallograph to check for weld flaws—and there aren't any here. You can't even see where the tubing ends and the weld begins. Their grain structure is identical. (The weld runs vertically down the center of the picture.) Even microscopic flaws are easy to spot on the acid etched surface. We also check the microstructure, cleanness, and grain size of the weld. Welded tubing must be flawless so we don't depend on visual inspection alone. To be absolutely sure, we test our tubing far beyond specifications. To do this we have designed new and more accurate testing equipment. Some of this test equipment even tells us when it is not working properly. We go to extremes to be sure that USS National Electric-Resistance Welded Tubing will stand up in critical pressure and mechanical applications that demand the utmost in strength, dependability, and uniformity. If you'd like more information, write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS and National are registered trademarks



National Tube Division of United States Steel

USS

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division, Chicago
United States Steel Export Company, New York

IMPROVE INSPECTION EFFICIENCY WITH ANSCO MONOPAK X-RAY FILMS

Modern non-destructive testing requirements call for fast and accurate flaw detection. That's why experienced technicians depend on Ansco Superay® 'A' and 'B' Monopak X-ray films . . . for quick and positive readings. Take advantage of the dependability and ease-of-handling convenience offered by Monopak. For information about how Monopak can improve your inspection efficiency write: Ansco Industrial X-ray Department, Ansco Division, Vestal Parkway East, Binghamton, New York.

Ansco
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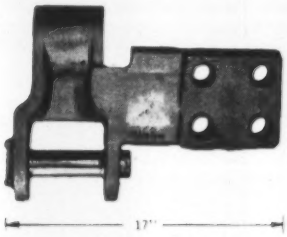
6000 hours continuous operation without conveyor down-time

A demonstration of WHEELABRATOR'S

VITAL VALUES

A 70 cu. ft. Wheelabrator Tumblast handles loads of steel castings weighing up to 10,000 lbs. each, 16 hours a day, 6 days a week for a prominent Milwaukee steel foundry. This is one of the most severe tests of strength and durability that can be given the work conveyor of any blast cleaning machine. Yet, in 6000 operating hours, there has been absolutely no maintenance required on the rugged work conveyor of this machine. The reason—the work conveyor is just one of the many areas where the Vital Values built into every Wheelabrator keep these units operating at their peak of blast cleaning efficiency for thousands of hours—at bigger savings to you. Write today for the Super Tumblast story.



Conveyor link removed for inspection after equivalent of 3 years' single-shift operation. No perceptible wear has resulted in any area.

Heavy duty machine components take the beating of 10,000-lb. loads in stride to save operating and maintenance costs.

VITAL VALUES FOR INDUSTRY

WHEELABRATOR AIRLESS BLAST EQUIPMENT

WHEELABRATOR CORPORATION, 510 S. Byrkit St., Mishawaka, Indiana. In Canada: WHEELABRATOR CORPORATION OF CANADA, LTD. 1901 Birchmount Rd. P.O. Box 490, Scarborough, Ontario
A subsidiary of Bell Intercontinental Corp.

Roll forming shapes like these is like automating a stamping plant...

"We think of these bins full of roll formed samples as *idea material*," Lou Colleran, Vice President-Sales explains. "Roll forming has limitations, of course, but it cuts out a lot of individual handling, punching, notching, drilling and embossing operations. *Not only can we roll a complex shape—we can pre-notch, pre-punch, and roll in lines, designs and decorations, all at the same time, in a single efficient forming operation.*" This, briefly, is the story of Roll Formed Products Co.

They work mostly with steel which is supplied by J&L in a variety of metallurgical grades, gauges and widths to meet the needs of a long list of customers.

Manufacturers of appliances, automobile parts, hardware, office furniture, metal partitions, electrical apparatus, business machines, shelving, and construction materials all save time and money by utilizing roll formed shapes.

Steel is basic to virtually all these roll formed products, and J&L consistently supplies the right steel in the right quantity at the right time. J&L can do the same for you.

Ask your J&L representative to give you the facts.

J&L STEEL

Jones & Laughlin Steel Corporation
3 Gateway Center, Pittsburgh 30, Pennsylvania

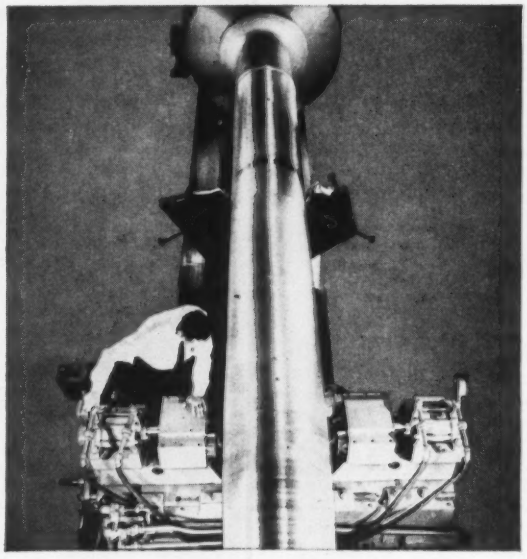
This Steelmark identifies products made of steel. Place this mark on your products. And – look for it when you buy.

Steel

▲ **Thousands of roll formed shapes** are created by Roll Formed Products Co., Youngstown, Ohio, for use by appliance, automobile, hardware, office furniture, and construction materials manufacturers, and many others.

Roll Forming is a highly specialized art. ▶ In one continuous operation, the coil of steel passes through a series of rolls, is formed, notched, punched, cut to length, then stacked for transport to loading and shipping area.

COLD ROLLING PUTS A "TOUGHER FACE" ON SHIP PROPELLER SHAFTING



Raging, slashing storms are not the only enemy of the men who build and sail the ships of the seven seas. A silent, slow but more relentless maritime antagonist is salt water corrosion which seeks out the minutest chinks in the ship's armor for its points of attack.

One of the areas of the ship most vulnerable to this corrosive action is the tail shaft. Here, under the powerful whipping action of the propeller and the sea itself, surface fatigue gradually develops. At the point where shaft sleeve and propeller hub meet, as shown diagrammatically in Figure 2, surface fatigue causes a condition called fretting. In addition, sea water often seeps under the propeller hub and causes pits from which cracks gradually develop.

The seriousness of the problem is indicated by the fact that, since 1951, merchant ships classed by the

David Stout, Erie Forge & Steel Corporation is the author of this article.

American Bureau of Shipping have replaced almost 20% of all propeller shafts inspected because of condemnation resulting from cracks in the shaft. A survey of Naval vessels at Puget Sound Naval Shipyard during the period 1944-1954 showed that about 40% of all shafts inspected had cracks and that about 10% of these cracked shafts were condemned.

To increase surface fatigue resistance and thereby combat this salt water corrosive action, the Society of Naval Architects and Marine Engineers has strongly recommended that propeller shafts be surface cold rolled. Fatigue tests conducted by the United States Naval and Engineering Experiment Station quite clearly indicated that cold rolling materially reduces both fretting and corrosion.

Erie Forge & Steel Corporation was one of the first companies to design and build cold rolling equipment for use on ship shafting. Basically, the equipment consists of two hardened steel rollers—one a "hardening" roller and the other a "smoothing" roller — mounted on hydraulic cylinders. Rolling capacity of the equipment is 37,000 pounds for shafts of any length and up to 30 inches in diameter.

The rolling operation consists of rotating the shaft slowly as the high pressure rollers exert pressure on the shaft while rolling aft toward the taper. Before rolling, the shaft is machined to a diameter .005 to .010 inches greater than the required finish diameter. The total depth of the cold working is 0.50 inches after finish machining.

While a great amount of further research and development work remains to be done, there is no question about the favorable effect of surface cold rolling on fatigue strength of shafting.

The machine designed and built by Erie Forge & Steel Corporation and the cold rolling process used here have been approved by the Bureau of Ships, United States Navy.

SKETCH ILLUSTRATING THE FRETTING PROBLEM ENCOUNTERED WITH MARINE SHAFTING.

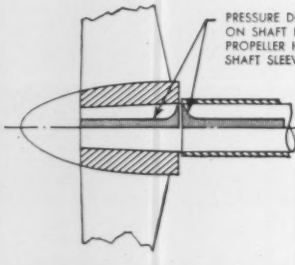


FIGURE 1

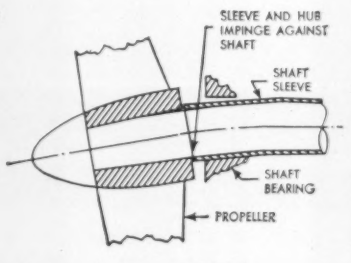


FIGURE 2

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

VAUGHN HAYES, Manager of Production Engineering, says:

"This Wean Slitting Line gives Chrysler Corporation's Twinsburg plant increased flexibility in production planning

by allowing us to purchase standard size mill coils. We slit these coils to meet specific production requirements, eliminating special-width coil purchases. The line's 2,000 ton-per-month output helps us eliminate production delays and coil supply problems." Mr. Hayes' comments are typical of reasons why companies are using the *coil processing concept* to lower material costs, reduce inventory requirements and decrease scrap loss. If you process 500 tons or more per month of flat rolled metals, write for our new brochure entitled, "Coil Processing."

This brochure explains the concept and economics involved in *coil processing.* It also illustrates the types of Wean equipment that can help you cut inventory, production, and material costs when you process standard *mill* coils instead of sheets.

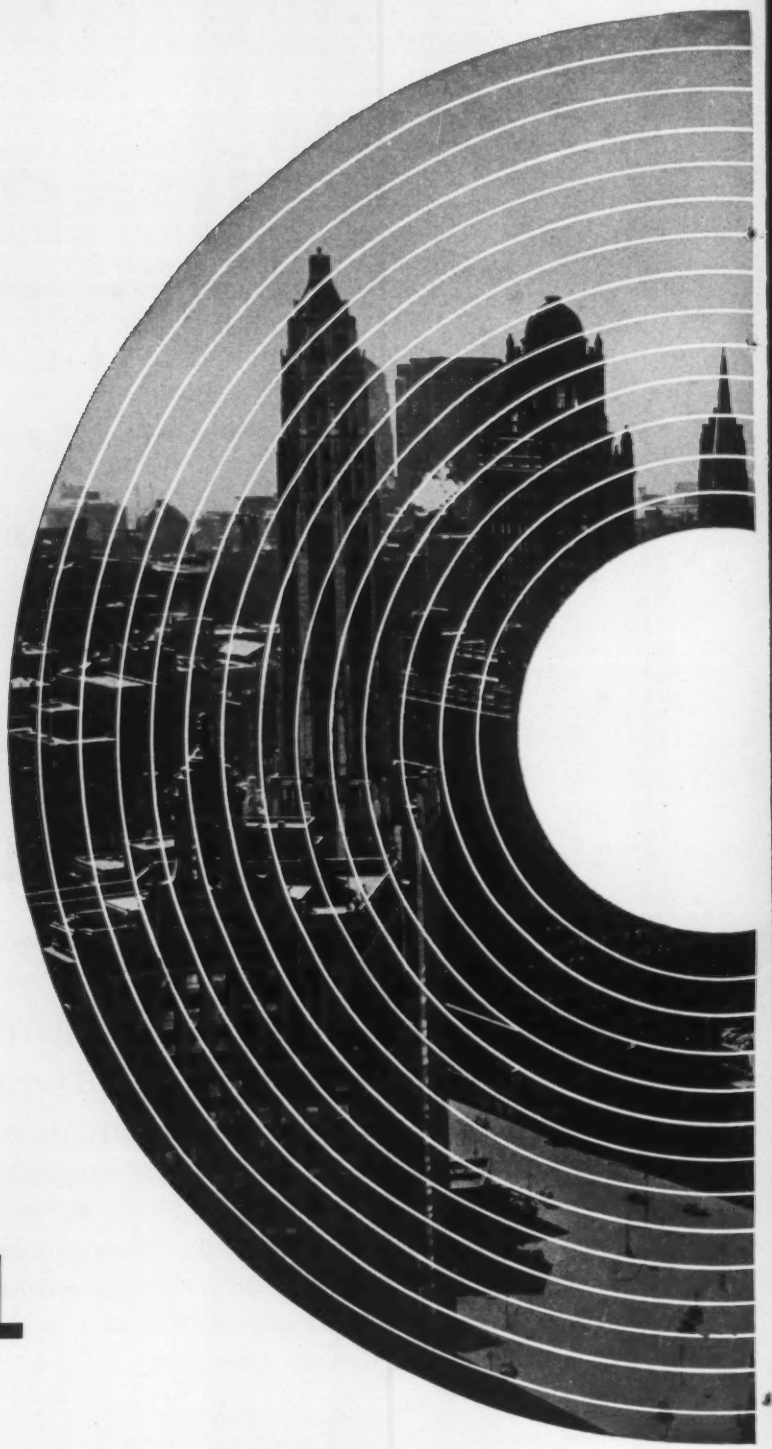
WEAN EQUIPMENT CORPORATION

22800 Lakeland Boulevard, Cleveland 17, Ohio Cable: WEANCOR

WEAN

Represented by these Associate Companies:

The McKAY MACHINE COMPANY (metalworking) • The WEAN ENGINEERING COMPANY, Inc. (primary steel)



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MORE
GALVANIZED
STEEL
FOR
MID-AMERICA
FROM
NEW

MIDWEST STEEL

For one of the greatest steel-consuming areas of the country, galvanized steel will now be in greater supply. The source is close, the service is fast, and the quality is second to none. Because

MIDWEST STEEL | **WEIRTON STEEL**

Portage, Indiana | *Weirton, West Virginia*

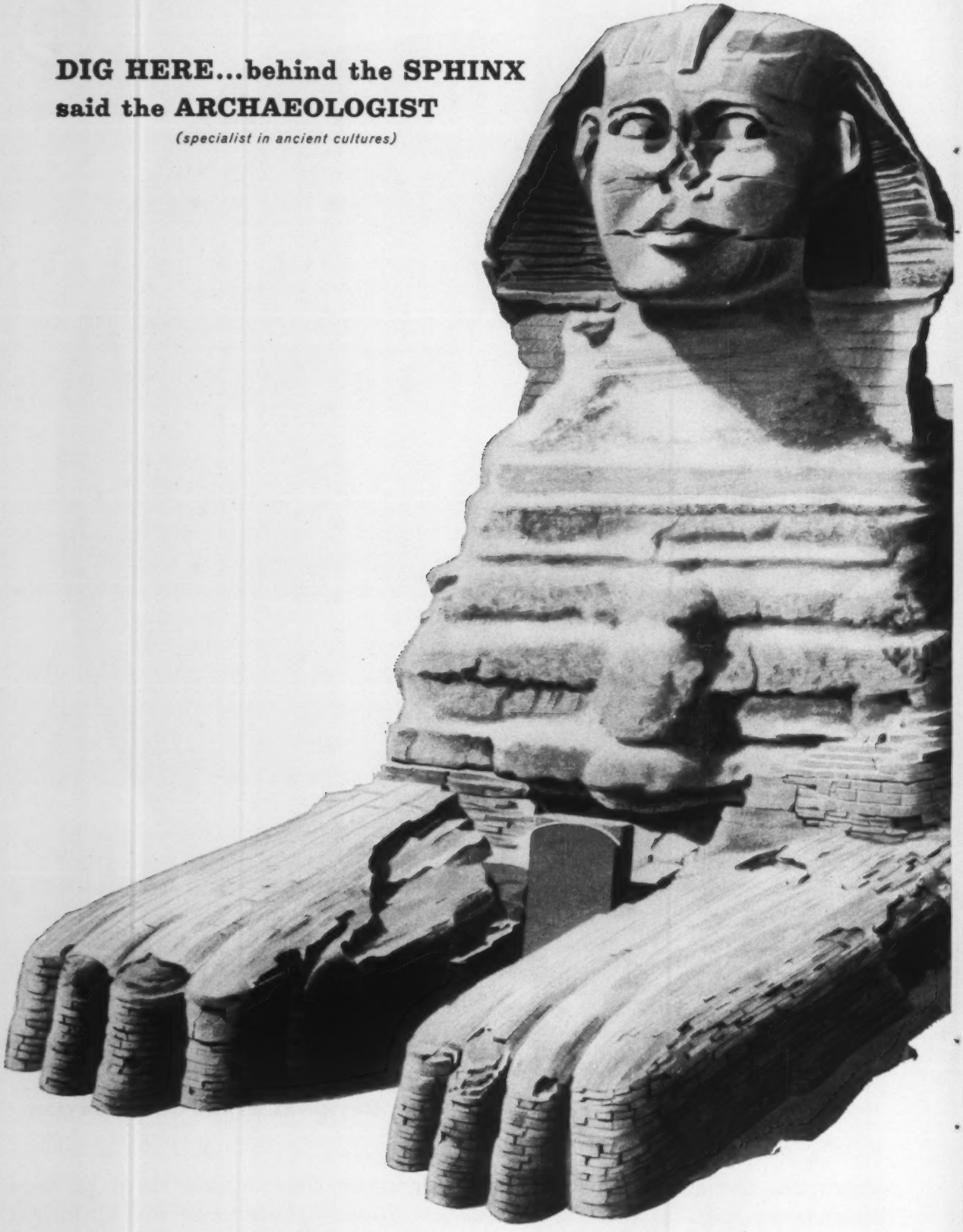
divisions of

NATIONAL STEEL CORPORATION

Weirkote, the modern continuous-process galvanized steel, is now being produced at our new Midwest Steel facilities in the Chicago area, as well as at our Weirton Steel division in the Pittsburgh area.

DIG HERE...behind the SPHINX
said the ARCHAEOLOGIST

(specialist in ancient cultures)



Flip a switch...Weld AC or DC said the man from LINCOLN

(specialist in arc welding)

FROM the look on the Sphinx' face, we'd say the Archaeologist is about to hit pay dirt . . . and why not? Knowing where to dig is his specialty.

And, incidentally, knowing where to dig to solve welding production problems is a specialty of LINCOLN Field Engineers. And that pays off for his customers!

Take the typical problem which existed in a Pennsylvania plant producing engines and compressors. The LINCOLN Field Engineer was in the shop on an electrode application. He noticed that the operators were constantly moving from AC welders to DC welders . . . and then moving back again. This continual changing was required in order to use the proper electrode for each of the many types of jobs . . . varying from fabricated bases to pressure piping, and from short runs to production jobs.

The LINCOLN man recommended installing "IDEALARC TM" AC/DC welders which produce either AC or DC current. The operator has merely to flip a switch on the machine to change currents. The plant superintendent was skeptical, but authorized putting in two "IDEALARCS".

Results were gratifying. Immediately, management was able to schedule any type production to these machines. The operators could weld with AC—flip a switch—and in an instant be welding with DC. Both production and morale soared. Soon, five additional "IDEALARC TM's" were installed and the production problem was solved.

That's why we say it's a good idea to do business with LINCOLN where arc welding is a specialty and cost reduction comes to you as a "plus" at no charge.

THE LINCOLN ELECTRIC COMPANY

Dept. 1911 • Cleveland 17, Ohio

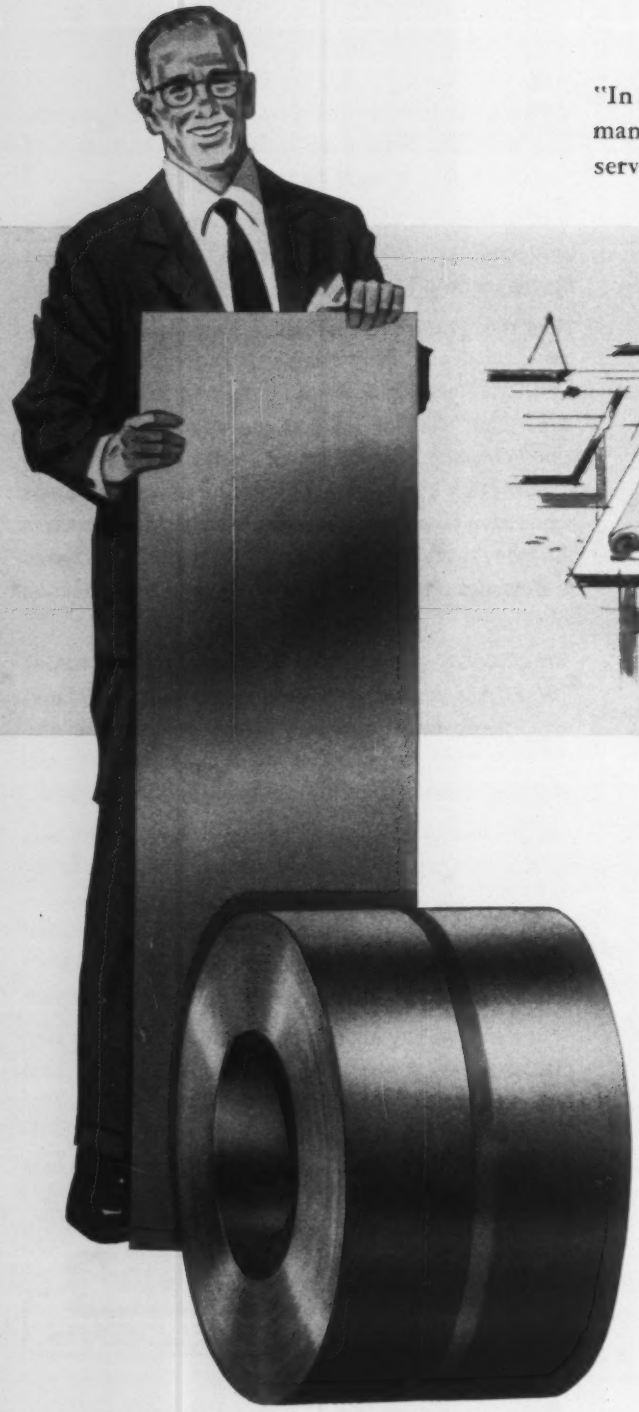
LINCOLN WELDERS

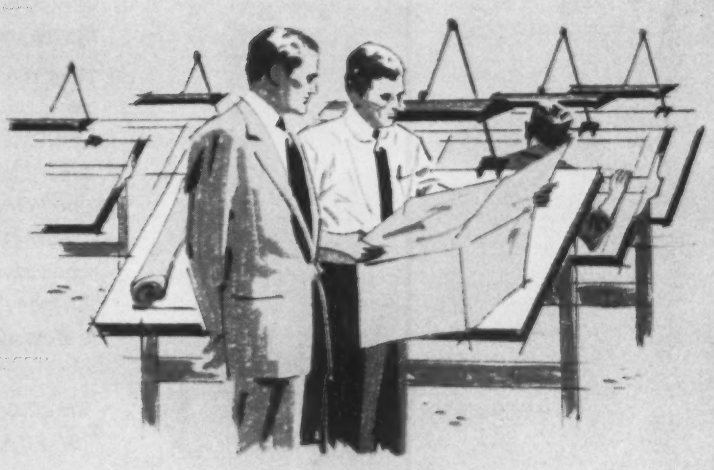
Metallurgist Harold Greene tells

HOW REPUBLIC SHEET AND

TO MEET YOUR

"In my 33 years as a Republic Metallurgist, I've seen many new developments in steel, and changes in service to customers. One of the most important to





CUSTOM METALLURGICAL SERVICE

"Our Custom Metallurgical Service is tailored to individual customers' needs. We try to stay flexible—study plans, blueprints, and product requirements with a customer's engineers—look over dies and production facilities with his production people—get the facts about cost limitations from purchasing.

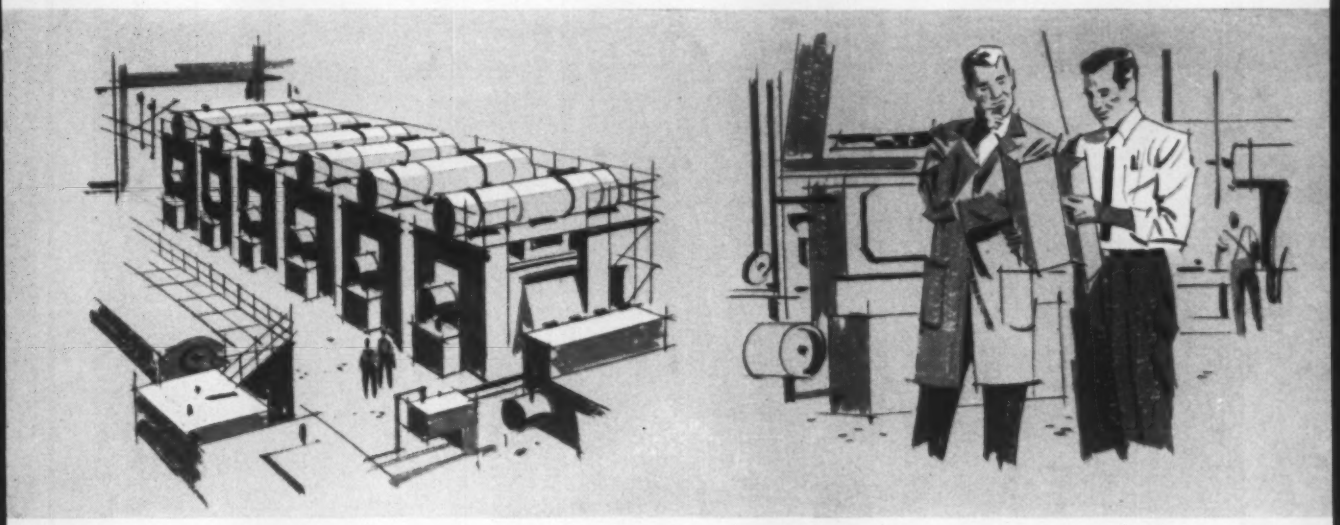
Our field work is backed by Republic's metallurgical laboratories, among the largest and best equipped in the world. In the end, our Custom Service is aimed at one thing—when we make a steel recommendation, we're sure it's the right one, and so is the customer."

Steel

Strong, Modern, Dependable

STRIP ARE CUSTOM MADE REQUIREMENTS

our customers is what we call Custom Service to give you Custom Made hot and cold rolled sheet and strip. Here's how it works:



FULL RANGE CAPABILITIES— EXTRA MEASURE OF QUALITY CONTROL

"Of course, it doesn't do any good to come up with precise sheet steel recommendations if you can't meet them. Here's where Republic puts its full range capabilities to work. We can pinpoint *complete* specifications on an order and know the Republic mills can meet them. For example, we're one of the few mills that produce sheets up to 90" wide, and, on the other hand, have facilities for rolling narrow widths in strip categories.

And when it comes to quality control, the latest equipment, like the new Surfacount electronic surface classifiers in our Warren, Cleveland, and Gadsden mills, assures that custom made Republic Sheet and Strip have the exact surface quality, physical uniformity and gage that our customers require."

FOLLOW UP SERVICE

"Our Custom Service doesn't stop when an order is delivered. Republic Field Metallurgists stay with a job—and, if trouble develops, they're right there quickly to help iron out the difficulty. All added up, it means that when a manufacturer does business with Republic, he gets more for his money—more service, better quality steel."

For more information on Republic Custom Service and Custom Made Hot and Cold Rolled Carbon Sheet and Strip, write Republic Steel Corporation, Department IA-1596—1441 Republic Building, Cleveland 1, Ohio.

Republic Sheet and Strip Products include:

HOT AND COLD ROLLED CARBON STEELS • ELECTRO PAINTLOK® GALVANIZED • GALVANEALED • STAINLESS • HIGH STRENGTH ALLOY • TITANIUM

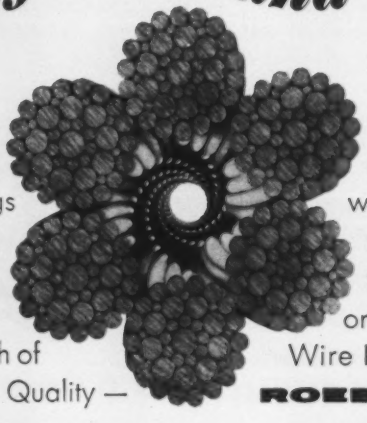
REPUBLIC STEEL

Cleveland 1, Ohio

World's Widest Range of Standard Steels and Steel Products

We put a lot of work into it
You get a lot of work out of it

quality inside and outside



Take a good look at the pictures. They show you where your savings really start — with the inner and outer uniformity of wires and strands. Unseen, but of utmost importance is the *extra* high strength of Roebling Royal Blue Wire Rope. Quality — inside and outside — is the extra working factor that pays off on the job for *you*. Find out more from your wire rope distributor, or write for free booklet to Roebling's Wire Rope Division, Trenton 2, N. J.

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UNCLUTTERED AIRSPACE—how to capitalize on it in your plant—with TRAMBEAM®

Airspace doesn't apply to the airplane alone. The uncluttered air space in your plant is a key to increased profits for you. Face it. The facts of your business operation are to move your raw material in—get it through your plant—and out the shipping dock **at a profit.**

Moving material **overhead** in a swift, unencumbered manner is **our** business. We've been at it for 75 years. Why not talk to a Whiting engineer about Trambeam and what it can mean to the profits of your company. No obligation, of course. Write: Whiting, 15601 Lathrop Ave., Harvey, Ill. *In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.*

Get the facts on Trambeam. Write for bulletin M-34.

See our catalog in Sweets

90 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

TRAMBEAM®

WHITING

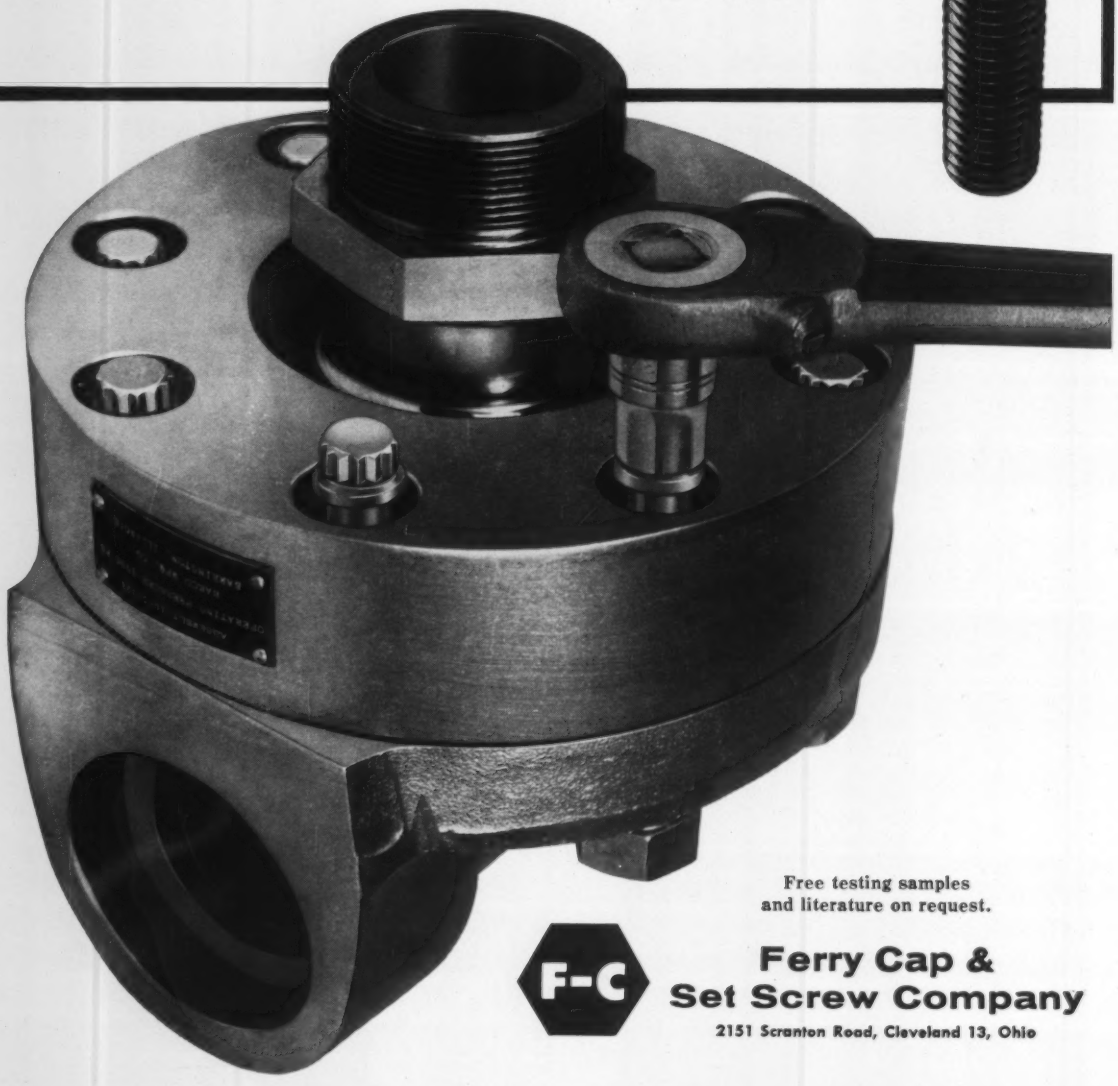
MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; PRESSUREGRIP; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL PROCESSING EQUIPMENT

Ferry Cap **Countr-bor** Screws Give Barco High Pressure Steam Joints Required Strength At Lowest Cost

Barco Manufacturing Company needs high strength screws of unquestionable quality for high pressure swivel joints capable of handling fluids at 1,000° to 1,200°F or steam at up to 850 psi. Their investigation found that Ferry Cap Countr-bor Screws are the only suitable heat-treated screws that provide tensile strengths of 170,000 psi minimum at moderate cost.

You get these advantages from Ferry Cap Countr-bor Screws:

- Wrench tighter and faster . . . 3 times the gripping surface of socket head screws.
- Fit in standard counterbored holes . . . wrench externally with standard socket wrenches.
- Improve appearance.
- Cost up to 20% less than regular socket head screws.
- High-strength, heat treated alloy steel.
- Sizes from No. 10 through 1".

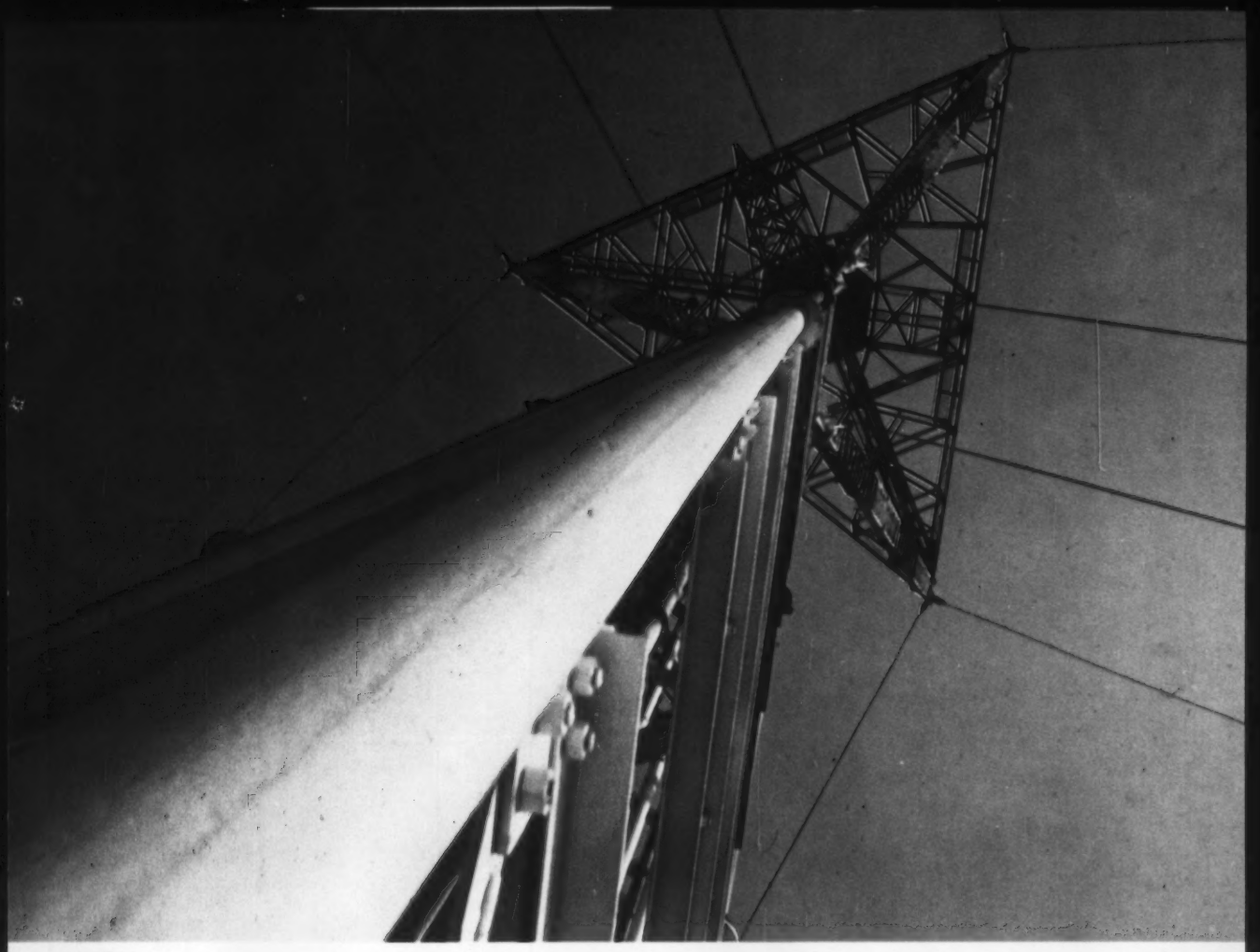


Free testing samples and literature on request.

F-C

Ferry Cap & Set Screw Company

2151 Scranton Road, Cleveland 13, Ohio



USS "T-1" Steel cuts size of tower legs 50%

This spectacular, 730-foot, candelabra-type TV tower in Baltimore, Maryland, was built to withstand hurricane winds of 165 mph. The legs had to be *extra* strong to support the weight of three 10-ton antennas plus the weight of a triangular platform 105 feet long on each side.

The designers chose USS "T-1" Constructional Alloy Steel for the legs because its great strength permitted a reduction in leg size of almost 50%. Wind resistance was reduced and only 105 tons of 5¾" to 7" quenched and tempered, straightened and stress-relieved "T-1" Steel rounds were used for the legs. If structural carbon steel had been used, approximately 300 tons of steel in diameters up to about 12 inches would have been necessary.

Chief advantages of USS "T-1" Steel

You may not be in the market for a TV tower, but if you are building large structures or rugged equipment, "T-1" Steel offers these plus values:

Super Strength—Minimum yield strength 100,000 psi in bar diameters up to 4 inches or plate thicknesses up to 2½"—three times the yield point of structural carbon steel.

Resistance to impact abrasion—Very high. Shovel parts, truck liners, conveyor parts, bins, chutes last up to five times as long.

Atmospheric Corrosion Resistance—Four times that of carbon steel. This results in a considerable increase in paint life.

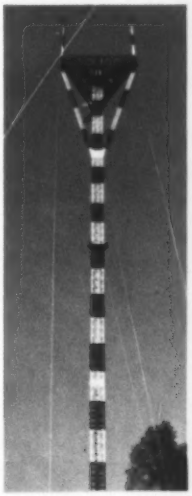
Toughness—Outstanding at both low and high temperatures.

Weldability—Readily weldable without preheating or stress relieving.

Costs—Where the designer takes full advantage of "T-1" Steel's superior properties, overall costs can be greatly reduced due to sizable savings possible in material, fabrication, construction and maintenance.

Write for our book, "Fabrication and Design of Structures of 'T-1' Steel," which gives complete information. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS and "T-1" are registered trademarks



World's first 3-antenna, candelabra-type TV tower for Baltimore stations WBAL, WJZ and WMAR. Designed and fabricated by Dresser-Ideco Co., Columbus Ohio. Erected by J. F. Beasley Construction Co., Muskogee, Okla.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

This mark tells you a product is made of modern, dependable Steel.

New top for the Shippingport reactor

By the Ohio River at Shippingport, Pa., the United States' first full-scale central station atomic power plant devoted exclusively to civilian needs continues to generate electricity for the Pittsburgh district. In operation since 1957, Shippingport's reactor core received its second "seed" fuel early in 1960. The pioneer atomic plant is a joint project of the Duquesne Light Company and the Atomic Energy Commission.

The nuclear portion of Shippingport was designed and developed by Westinghouse under the direction of and in technical cooperation with the Naval Reactors Branch of the Atomic Energy Commission. The work was done at the Bettis Atomic Power Laboratory which Westinghouse operates for the AEC.

U. S. Steel's Homestead Plant supplied the forgings for the closure-head assembly needed to accommodate a new and higher power core developed by the Bettis Laboratory for Shippingport. As furnished, the 3-piece assembly weighs 81 tons—and every ounce of these USS Quality Forgings was cast, forged, machined and tested to meet the most rigid specifications.

The reactor's new closure-head assembly for Core 2 consists of a dome, torus, and head flange. The largest piece—the head flange—weighs 41 tons. To insure the highest degree of quality from the start, it was electric-furnace melted from a Ni-Cr-Mo alloy steel, then teemed into a 180-ton ingot in U. S. Steel's vacuum-casting facilities. After top and bottom discard, it was forged to an 85″ octagon; then it was upset to 60″ in height. Next a 30″ hole was punched in it to provide for mandrel forging. This hole was later opened up to take a 36″, and finally a 54″ forging bar. At this point the ring was flattened to 43″, the bar was again inserted in the center and the ring was mandrel-forged to its final dimensions—159″ overall diameter, 98″ interior diameter, and 42½″ high, as shown in the big picture. It then weighed 83½ tons and was ready for heat treating and preliminary machining. Final machining reduced the flange's shipping weight to 41 tons.

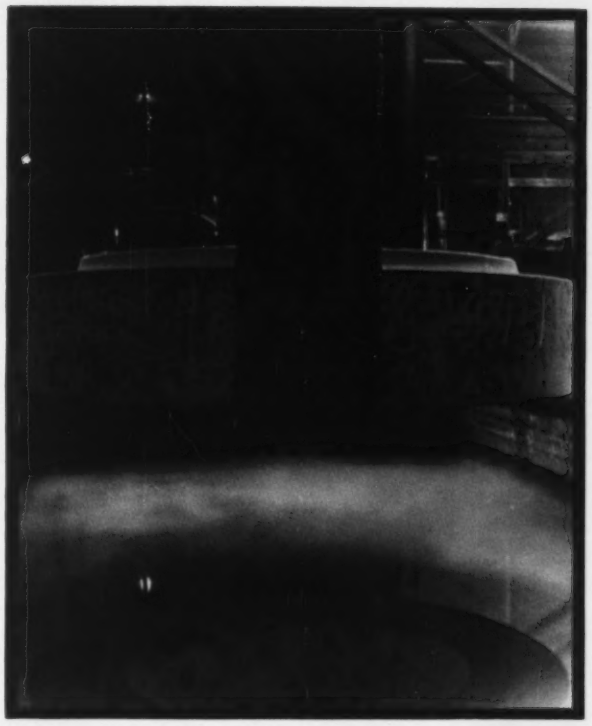
The torus, or "transition ring," was manufactured from the same grade of steel in the same careful, expert manner. It weighs 23 tons after final machining.

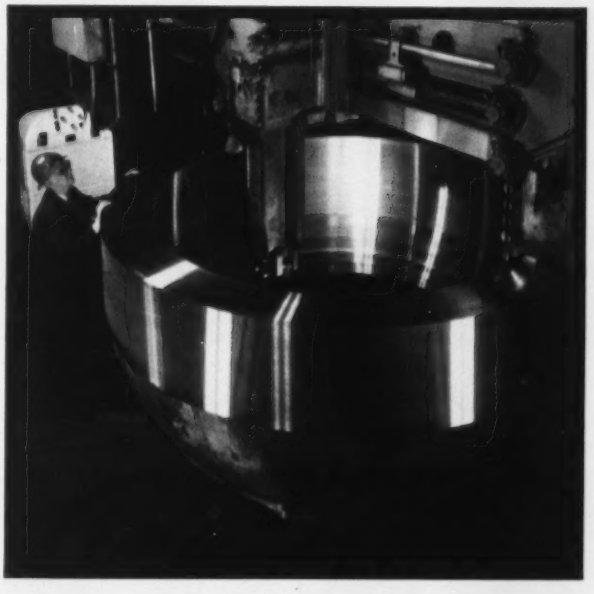
The dome is hollowed out on the inside and has a relatively small hole through its middle. This hole provides a refueling port; separate openings for control rod mechanisms were bored later. The dome was machined on our 20′ vertical boring mill with the aid of an electronic contouring machine. Final weight of the dome: 17 tons.

Dome, torus and flange were painstakingly tested and inspected every step of the way. Tests included ultrasonic inspection, tangential tension tests, Charpy V notch impact tests, grain size tests, bend tests and magnetic particle inspection.

U. S. Steel has the capacity, the men, and the equipment to manufacture quality forgings like these, whether they be rings, flanges, domes, pressurizers, tube sheets or other such nuclear and power plant components. And the very same men and equipment will be working on *your* order. For a free folder on USS Nuclear Forgings, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS is a registered trademark





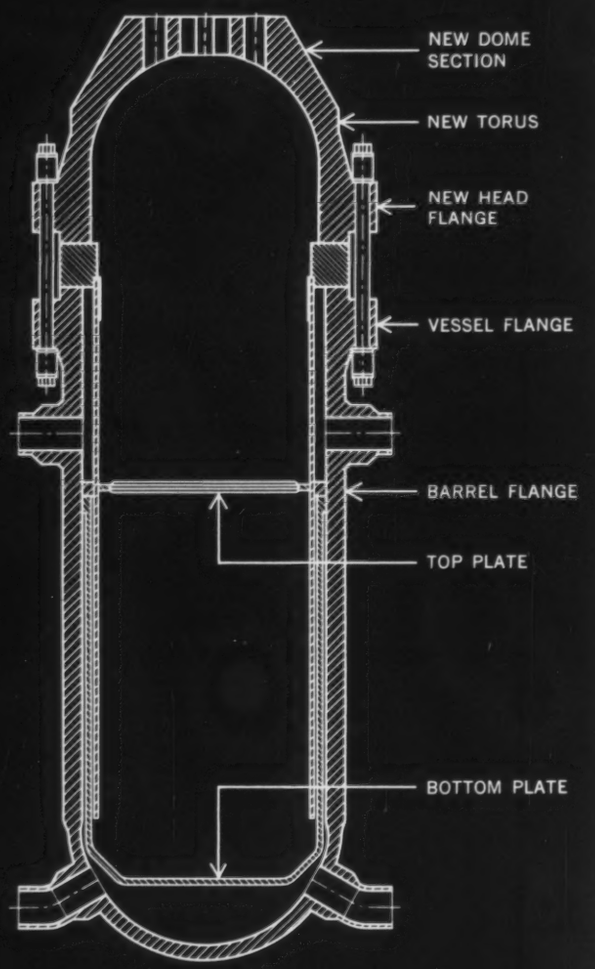
Photos, top to bottom—
head flange about to be quenched;
torus being contour machined;
ultrasonic inspection of dome.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

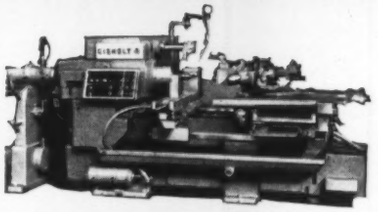
Core 2

FORGED COMPONENTS



Since the three parts of this reactor vessel head—dome, torus and flange—will be welded into a single unit, there can be no allowance for failure. Every square inch of these three USS Quality Forgings were painstakingly manufactured and carefully inspected during and after the manufacturing process to assure perfection. The men, the forging facilities and the inspection equipment are available to you if you need forgings that must be as close to perfection as we can make them.

SOMEBODY *is doing it for* LESS



GISHOLT MASTERLINE AR TURRET LATHE Converts for bar or chucking work in less than one hour. Sets up like a turret lathe, from the front—no gears to change—uses same standard tools. Cycle setting is learned in less than a day. Compare these extras: greater capacity at lower original cost than any comparable automatic; automatic withdrawal for chip clearing in deep holes; internal threading with solid taps requiring spindle reverse; external threading with self-opening die heads and automatic re-cocking; reverse feed and individually adjustable dwell to all tool stations; 16 spindle speeds and infinite feeds—none lost when threading. Optional: 8-sided turret; overhead cut-off slide or swinging stock stop; automatic recessing slide tools; JETracer® with turret slide tools.

Ask your Gisholt Representative for a desk-side demonstration, or write for Catalog 1224.

With recent developments in automatic machining, many manufacturers—maybe your toughest competitors—are cutting costs substantially.

Even small runs are going automatic—both bar and chucking work too! All this with the Gisholt AR® Turret Lathe at little more than the cost of a hand-operated turret lathe.

This is no exaggeration: the Gisholt AR can cut your *direct* machining costs by 25% to 40% on work now handled on manual lathes—can give you *indirect* savings in tooling, inventory, setup, inspection, materials handling and floor space. Investigate AR—your best answer to the cost-profit squeeze.

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Turret Lathes • Automatic Lathes • Balancers • Superfinishers® • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

SHIFTS IN AUTO ASSEMBLY POINTS are being made by Ford Motor Co. Starting the week of March 6, Comets will be assembled at a Metuchen, N. J. plant which now turns out Falcons. In the same month, the Ford assembly plant at Chester, Pa., will be closed. Reason: Too costly to convert to Falcons. Regional protests apparently are in vain.

A BOOST FOR SMALL COMPANIES in labor-surplus areas was given last week by a new Small Business Administration ruling. The SBA will allow a differential of 25 pct in present company size standards used to determine eligibility to receive SBA financial, production and procurement assistance. Manufacturing companies with up to 1250 employees could be affected by this ruling. Size standards vary by industry.

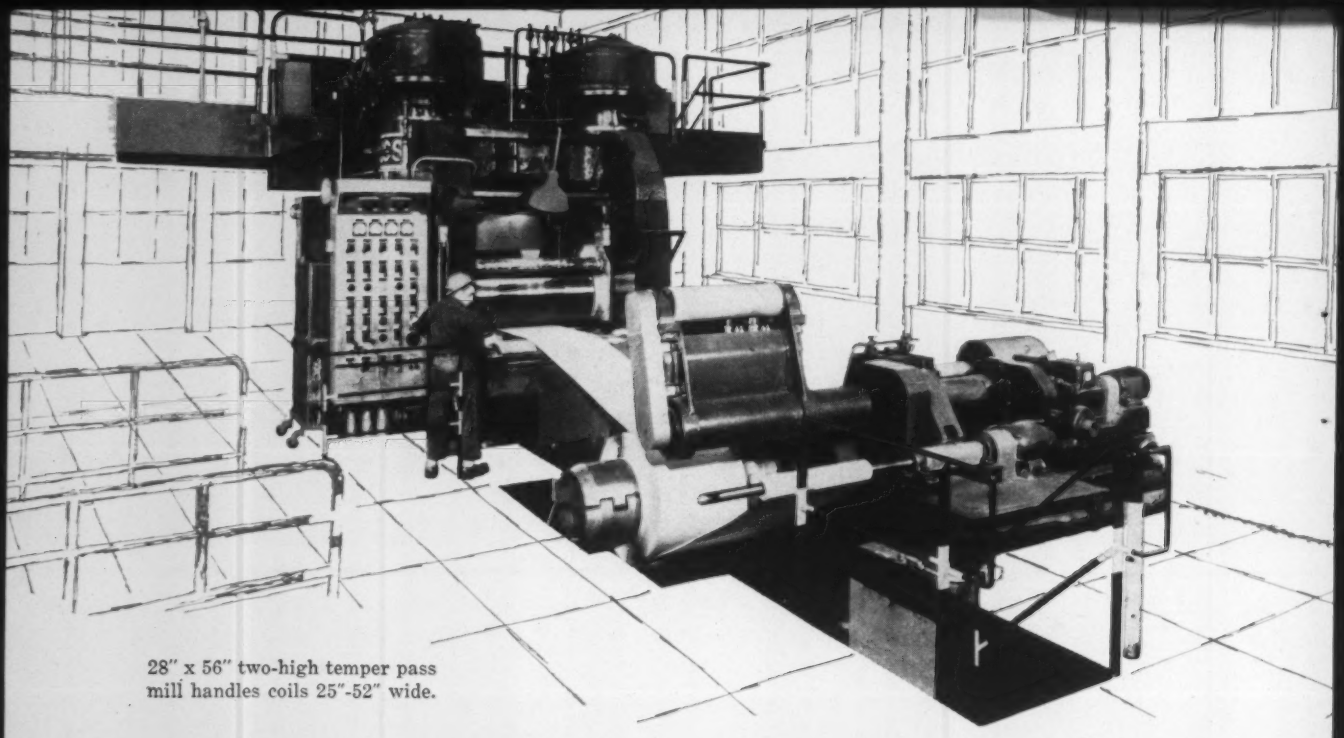
CONSUMER DURABLE PRICES had their first turn-up in 11 months in October, according to the Labor Dept. But any hopes that this may have been the start of a trend have been nipped. A further decline occurred in November. The Dept.'s price index (1947-49=100) has dropped from 114.1 in November of 1959 to 110.7 in November 1960, the latest complete figures available.

LEASING, AS A MARKETING APPROACH, may lose some of its steam if depreciation taxes are liberalized. And all signs point to eased taxes in this area. One top executive of a business machine company says he looks for more sales, fewer leases of his equipment when tax rules are changed. Working capital will not be so hard hit by need for large replacement reserves, long an argument in favor of leasing.

INVENTORY CUTTING IS STILL ON. It may remain with industry until June or later. Example: Many steel warehouses are trying to turn inventory into cash. Their orders are not as good as advertised. And because of the great number of sizes, many warehouses have to carry a lot of stock in the face of fewer orders. Buyers still look for deliveries from stock.

MOTOR TRUCK PRODUCTION 1961 should be slightly under 1960 levels, says the Commerce Dept. Production in 1960: 1,142,000 units.

EUROPEAN STEEL MILLS continue a trend to oxygen-converter steel. Almost 60 pct of the 3.4 million short tons of crude steel produced in Austria in the first 8 months of 1960 was made by this method. Seven-eighths of Austrian steel mill products are commercial grade items.



28" x 56" two-high temper pass mill handles coils 25"-52" wide.

Now 2 new Bliss mills help keep tempers under control at Gary Sheet & Tin

Until last summer, Gary Sheet & Tin tempered "stainless" on the temper mills used for carbon steel. Then to add a new dimension of efficiency, the plant decided to set up separate facilities for stainless and installed a new Bliss temper pass mill to handle it.

Product of Gary and Bliss thinking, the mill takes coils as wide as 52", as narrow as 25"; tempers gages from .008-.150" to an average hardness of 83 Rockwell. Result: this plant of U.S. Steel is now more able to take heavy workloads and special orders in stride.

Another Bliss temper mill is paying similar dividends in Gary's continuous pickling line. Key addition of an April '59 expansion program, this 34" x 76" two-high mill with husky entry and delivery bridles enables Gary to handle strip 18"-62" wide, in thicknesses from .059"-.187". It reduces stock 1½-2%, serving to fracture the scale, thus resulting in less pickle liquor required and higher pickling rate.

Can a custom-designed Bliss mill help you solve a profit-robbing problem? See how the Rolling Mill Division has assisted other plants. Write today for our 84-page Bulletin 40-B.

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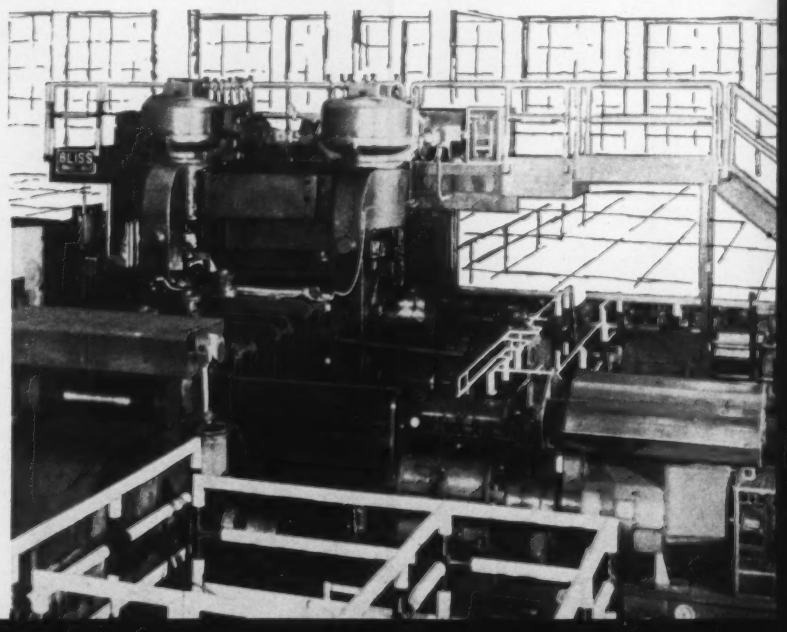
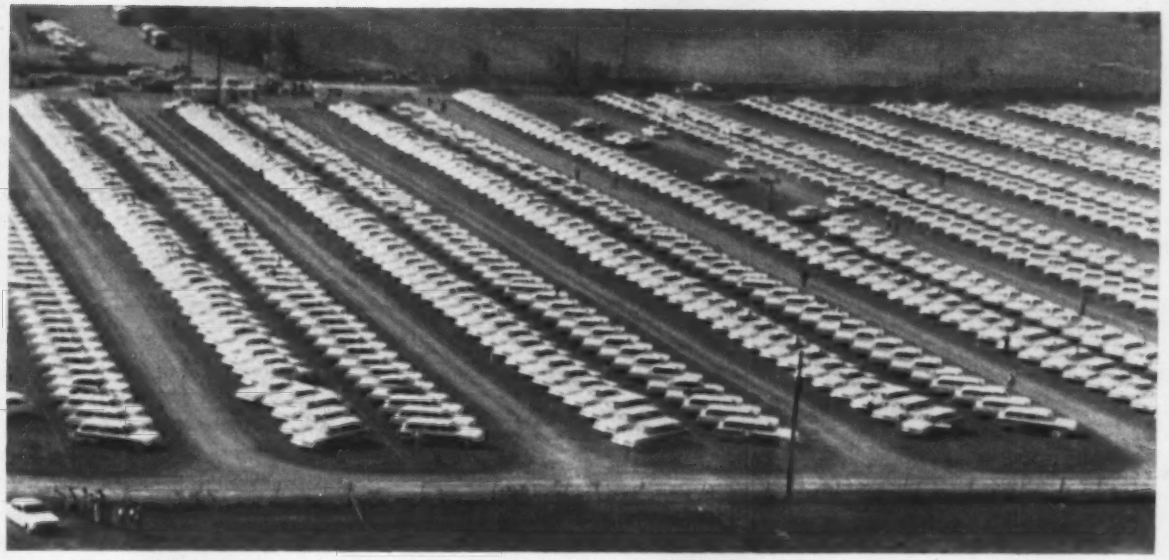


34" x 76" two-high mill in Gary's continuous pickling line descales and tempers at the same time.



ROW UPON ROW: Scenes similar to this field full of 1961 model cars are to be found all over the country.

New Cars Back Up on Dealers; Automakers Fight '58 Trend

No automaker forecasts 1961 car sales sagging to 1958's recession low of 4.2 million units.

But with a million unsold new cars as spring nears, there is less talk of 7 million car sales, more of 5.5 to 6 million.

By A. E. Fleming

■ For the second straight year, automakers approach spring with a million unsold new cars.

Winter sales fell far short of expectations. Employment is far below its 1955-57 peak. And production is starting to buckle. The industry realizes it's smack in the middle of one of its roughest struggles.

Virtually every company, while watching daily sales closely, is pulling its production punches, anxiously awaiting signs of encouragement. There have been none in the past two months.

Smallest in Years — Output of 414,000 cars in January was the smallest for the month since 1952. February's estimated 370,000 also will be the smallest in nine years. March offers little promise at this point, unless sales make a sudden and complete about face.

The result could be a first quarter production count no better than the 1,238,000 of 1958. Only 4,244,000 cars were made in the entire 12 months of that year.

Nobody expects 1961 to fare so poorly. But there is less talk these days of 7 million car sales, more of 5.5 to 6 million.

What's Wrong? — With assembly plants closed for week-long stretches or plugging along almost half-heartedly, automakers today are wondering what's wrong. There aren't many satisfying answers.

One explanation for January's sales drought was the East's crippling snow and the Midwest's gripping cold.

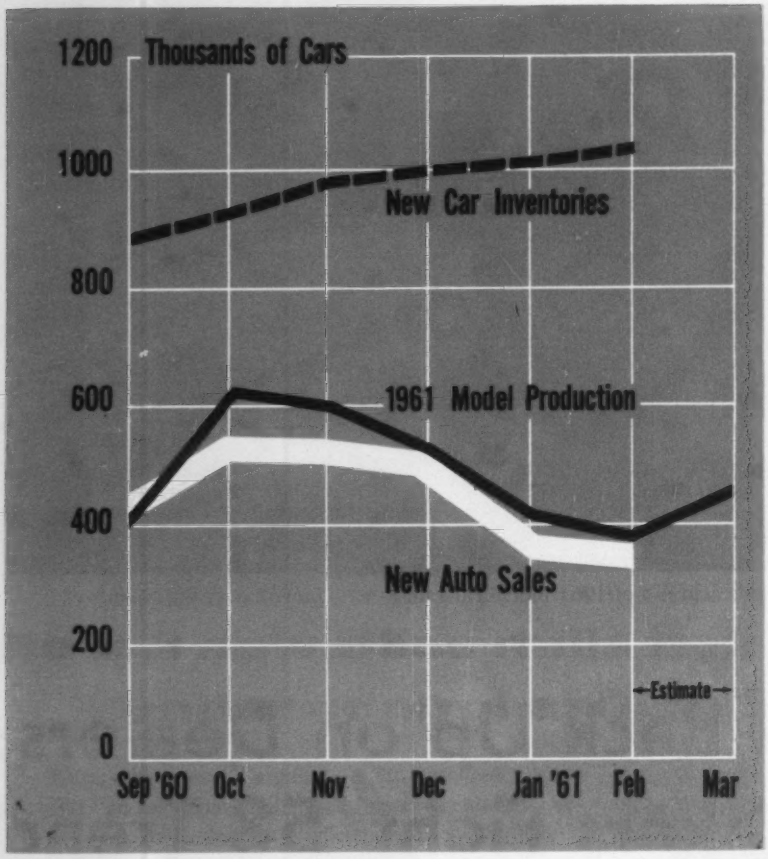
But to great and growing numbers of unemployed workers in such depressed areas as Detroit, Cleveland and Pittsburgh, it is more than this. They answer with another question: Who can buy a car without a paycheck?

Without question, as March gets underway, automakers are down in the dumps.

Frustrating Inventory—Symbol of the frustration, although many industry officials say not, is the million car inventory. On March 1 the unsold domestic vehicles will add up to a 70-day supply.

It was exactly a year ago that the

Will Spring Bring a Pickup?



million mark was reached for the first time. It eventually climbed to a record 1,060,000 by the end of July. And, it is nearing that peak again.

According to some industry leaders, the seriousness of the inventory is not great. To others it is.

In San Francisco for the annual National Automobile Dealers Assn. convention, Chrysler Corp. president L. L. Colbert admitted the supply got out of hand because sales haven't developed as expected.

His new administrative vice-president, L. A. Townsend, explains that once inventories are reduced, output will be set at a realistic level based on a daily sales rate. This is something which apparently has been recently ignored.

Must Sell 400,000 — Flexibility and capacity are musts in today's market, says B. D. Mills, Lincoln-Mercury general manager. But he thinks the million car stockpile should be cut by as much as 400,000 units.

L. A. Iacocca, Ford Div. general manager, stresses his company doesn't like oversupply. He says sales last summer fell short of projections, costing Ford and its dealers a great deal of money.

Showing no anxiety at all over the big inventory is General Motors Corp. board chairman, F. G. Donner. Perhaps this is because GM is in a better inventory position than its competitors. He doesn't believe inventories are out of line with demand. He contends the huge supply is necessary, considering the wide variety of models the industry offers.

Unsold 1960 Models—One trouble spot, nonetheless, has been the huge carryover of unsold 1960 cars into the 1961 model season. There were 100,000 of them around January 1, and more than 50,000 a month later.

In March, with 1960's out of the way, dealers should be able to concentrate fully on 1961's, something they haven't been able to do for five months.

Compacts, also, are contributing more heavily to the stockpile this year than last, mainly because there are more of them. The 10 compacts comprise nearly 100 different models.

"Medium" Compacts — Making up about 8 pct of the inventory are the four "medium" compacts which came out last fall, the Dodge Lancer, Buick Special, Oldsmobile F-85 and Pontiac Tempest.

Indications are the Lancer and Special, expected to spur Dodge and Buick sales, haven't been coming through. Tempest and F-85 seem to be doing somewhat better.

Year's Dark Horse—Real dark horse of the year is Corvair, bolstered by its top-priced Monza. The Chevy compact is starting to give Falcon, No. 1 compact seller, sturdier competition.

There is a feeling, however, that there may be too many compacts, or at least too many models in some lines.

But compact addicts continue to predict the smaller car market is still developing and will make further inroads.

No Sitting Still—Meanwhile, if automakers could be sure of selling anything these days, they'd be happy. But they aren't sitting on their hands.

To stir the nation's 100,000 car salesmen, they are coming up with an old standby, the sales incentive contest and bonus.

Price Cuts—In another effort to get going, American Motors last week cut the wholesale price of its two American series, raising the dealer discount from 21 to 23 pct. This amounts to a $30-$40 cut.

Despite such moves, the outlook is not bright for the next several months.

Management Hunt Under Way

Personnel Men Expect a Real Shortage by 1970

Industry is searching harder than ever for well-trained men with executive potential.

Personnel experts say the next ten years will bring forth less skilled workers.

By K. W. Bennett

■ The 1960's will bring a new industry personnel pattern: Too many Indians and not enough chiefs.

This is the forecast of personnel men attending the Midwinter Personnel Conference of the American Management Assn. in Chicago last week.

Inland Steel Co.'s director of Personnel administration, F. H. Cassell, points out that most skilled workers and management men are drawn from employees in the 35 to 44 year age group. This managerial pool grew by 2.5 million in the 1950's. It will decline before 1970.

Lack Replacements — The replacements—those between 25 and 34 years of age—grew by 2 million in the past ten years. However, this group will show no gain in the next decade. But the youngsters of the nation's work force will increase in number from 19 million to 25 million. Persons over 45, chronic sufferers of extended unemployment, will increase by 5.5 million.

On top of this, the shortage of upper grade engineering and executive talent will become more acute.

The growing pinch for trained engineers and executives is also noted by C. L. Burgess, president, American Machine and Foundry Co. He says industry employed one engineer for every 60 workers in 1950. In the 1960's, this ratio will drop to one engineer per eight workers.

Need for Researchers — According to H. W. Johnson, Massachusetts Institute of Technology, demand for research personnel has doubled every 5.5 years since 1920. This, he says, will continue.

Also noting personnel pattern changes is N. S. Gomsrude, North American Aviation Corp. His company employed 15,000 workers in 1951 and 85 pct were blue-collar workers. Today the company has 75,000 employees with less than 40 pct in blue-collar jobs.

Requirements Changing — Even job requirements are changing. Maintenance men must be capable of repairing complex electronic equipment. D. C. Snoyenbos, personnel director, AC Spark Plug div. of General Motors Corp., refers to new workers as "technicians." Many have at least two years college and are pre-tested, hand-picked, job-trained and represent major investments.

The 1960's look good for college-trained men. But, points out Mr. Cassell, only 30,000 engineers are graduating annually.

For Job Seekers — Because of this, many companies are even reorganizing engineer recruitment. Lounges have been set up as waiting rooms for engineer applicants; more time is taken explaining fringe benefits; offices are being converted into smaller "team" facilities.

But the predictions for the next ten years still remain the same: Heavy increases in unskilled or semi-skilled workers; continued shortages, and growing demand, for college-trained executive and engineering manpower.

Industry Leaders Predict . . .

Inland Steel's F. H. Cassell: "The shortage of people in the 25 to 44 year-old age group could become a crucially limiting factor in industry and might require premature upgrading of younger groups. And there will likely be strong upward pressures on salary levels for this group."

MIT's H. W. Johnson: "The company that survives and grows . . . must have, as never before, top leadership.

"Each company must find a way to broaden its internal management selection process as opposed to the tendency to narrow it with new specialties. Each company must find ways to expose its best people to the broader demands of the business as opposed to the tendency to encourage good men to specialize."

Kennecott Refining Corp.'s N.L.A. Martucci: "Few needs are as acute as the need for adequately trained managerial and professional talent in an expanding economy . . . As long as there are more key positions than there are qualified people to fill them, top-notch talent is constantly exposed to 'tempting offers' of other companies."

American Machine & Foundry's C. L. Burgess: "I believe that because of the rapidly changing trends in technology and administration, a company must recognize now, on the basis of its products and plants, that a projection of technical and management skills will be needed in the next five or ten years."

New Ideas Cut Buying Costs

Purchase Analysis Team Breaks Precedent to Trim Costs

Four-man engineering team, a part of the purchasing department at Eaton Manufacturing Co., brainstorms buying projects.

The object is to come up with cost-saving ideas.
By T. M. Rohan

■ "Purchase analysis is currently in popular vogue in the purchasing business. This is no magic. It basically amounts to freeing good purchasing men and engineers from routine tasks and giving them the time to sit and look at a product all day if necessary, to come up with a cost-saving idea.

"It is not romantic at all. It is mostly just plain hard work and the use of common sense."

This, basically, has been the guiding principle of H. A. Williams, director of purchases at Eaton Manufacturing Co. in Cleveland in developing the company's highly successful purchase analysis program. It covers an annual outlay of $150 million for 23 manufacturing divisions and subsidiaries in 33 plants, from 7000 vendors. About $35 million is in steel alone.

The Team—The purchase analysis team at Eaton currently consists of two mechanical engineers and an industrial engineer working under a supervisor. This team carries on a continuing search into what materials are being used on various products, why, and how they are made. On new products, they thoroughly check out whether to make or buy parts before production ever gets going, pick vendors and check their methods. Naturally they also originate and carry through cost-saving projects. And lastly the section is an ideal training ground for future purchasing agents.

"The old and ordinary way of handling new products has been that engineers make up blue prints. Purchasing then secures bids and awards the job to the vendor they think best suited and has best prices," says Mr. Williams.

"Into this routine we have injected the new element of analytical buying. Our purchasing engineers brainstorm the whole project and all its parts. We also have to do some heavy arguing with the design engineers who often want to build the product to last forever.

Selling Needed—"We are not trying to simply cheapen it or lighten it. This is a hard point to get across. We simply insist that every part must justify its existence and therefore its cost," Mr. Williams says.

In some cases, discussion over parts, what they are made of and how, has led to cost-cutting and improving the product at the same time. Such an instance was a small cup on a ring gear. Its function is to scoop up oil as the gear rotates and thus help lubricate. This was originally made of steel like the rest of the gear. Now it is made of plastic at a slightly lower cost. But it has worked out better than steel because if it comes loose, there will be no gear damage.

Some of the parts which get a going over are parts of the Eaton two-speed truck axle plus pumps, tappets, valves, fasteners and the hundreds of other products supplied to almost every major industry.

This results in quite a few conversions among weldments, stamp-

$150 MILLION TEAM: Home office purchasing staff of Eaton Manufacturing Co.'s Cleveland headquarters supervises purchases of $150 million annually for 30 plants. Left to right are Mrs. Donna Hart, secretary; H. A. Williams, director of purchases; W. H. Williams, supervisor of production and mill supply purchases; P. W. Knox, supervisor of steel purchases; W. B. Moss, traffic manager and R. F. Fitzgerald, manager of purchasing research and analysis.

ings, castings and forgings, changes in metals and also in shop practices. The group also gets into "make or buy" decisions and it has gone both ways, depending on circumstances. They also aid in vendor selection when new parts are brought out.

Eaton now has an estimated 1200 products and is continually coming out with new ones. The purchasing analysis team gets into this too in helping in selection of vendors.

Vendor Relations—"What we do is talk to vendors and explain the new product we are planning on coming out with and try to get them to help share the risk," Mr. Williams says.

"We ask them to give us their best unit price and what volume will have to be obtained to hold it. Then how long it will take to work it out. In return we pledge to give them special consideration on all new business when and if the product catches on. It has generally worked out very well and has given new products better chance of success."

Another unusual aspect of the Eaton purchasing analysis program is the "secret ballot" type report and continuing follow-up. Conferences among the staff or with vendors are always written up and summarized by one of the project leaders. But the write-up is shown only to the section manager. This eliminates involving personalities. Also there is no boasting of success of programs. Visits of suppliers are logged, numbers of projects assigned, objectives spelled out and target figures set.

Idea Production: What to Do, What to Avoid

■ For a faster flow of new ideas, start looking forward more and backward less.

This word comes from the company that has probably gone as far as any into the business of organizing progress. In training programs and in its value analysis concept, General Electric Co. has been working for years on the rules for producing and recognizing good ideas.

Some things to do and not to do for idea production have been outlined by C. M. O'Grady, a consultant in GE's manufacturing services group.

Identify The Job—Mr. O'Grady recently told Pittsburgh purchasing men that a search for the best way of doing something should start with consideration of basic function. You don't begin by attempting to modify the existing method, he says. You first identify the job to be done and then cast about for methods.

Mr. O'Grady cites countless examples of how this change of approach has brought a rush of light and a slashing of costs. While designers or buyers regarded themselves tied to a specific plate or stud, they went for years at a high cost. Once they set aside the old way and began looking at basic jobs, they were able to cut costs with completely new designs and materials.

Shake Old Habits—This notion sounds easy enough. The trouble is, the pull of the past is strong. Mr. O'Grady catalogues some of the ways this pull can act to prevent the birth of new ideas or bring about their rejection. Prominent in his listing are, "habits."

It took 50 years, he says, for stove manufacturers to shake off design habits formed in the days of the coal range. The heavy construction of the range and its basic arrangement carried over long after there was any functional need.

Moreover, Mr. O'Grady indicates habits can form in relatively new product areas. General Electric was ready to spend $50,000 for a concrete structure to shield an X-ray laboratory. Then someone got the idea of checking less conventional shielding materials. Use of dirt instead of concrete ultimately reduced cost to $5000.

Check Your Attitude — "Attitudes" are listed as another tough roadblock for new ideas. These show up in a variety of catch phrases: "We're too big." "We're too small." "Top management won't approve." "It's against policy." "We tried it once and it didn't work."

Once thought processes have hardened in the past this way, it takes a jolt to bring serious consideration of change. The idea of double reduction for tinplate was first rejected with the pronouncement, "It won't work." When circumstances forced a trial, this turned out to be an attitude rather than a considered opinion.

"Attitudes are tough things to change," says Mr. O'Grady, "but the real paydirt comes when they do change."

Keep Pace—Other progress stoppers involve a failure to keep up with change in the outside world. "Lack of information" led GE to pay 7.5¢ for a stud until someone found it could be supplied from a diecaster for 1.5¢. Cost of a motor screen was cut from $6.26 to $1.25 by taking a wider look at the sources available.

Closely related are what Mr. O'Grady calls, "honest wrong beliefs." Typical of these, he says, is the notion that "plastics are brittle."

Another good line: "It would cost too much to buy tooling to cast it." GE had to break through this belief before it could cut the cost of an arcing horn $4 by going from a brazed assembly to a casting.

Steel Strikes Back at Imports

Industry Rediscovers and Improves an Old Product

In recent years, producers of reinforcing bars have seen their markets taken over by imports.

But, by putting new emphasis on high-strength rebars, they are regaining some lost business. By T. M. Rohan

■ Old-line steel reinforcing bar producers have been frustrated for years as they watch their markets being chipped away by imports, domestic re-rollers and all-scrap-charge electric furnace mills.

Now an old but seldom used product—high-strength rebars—is being dusted off and sent into the fray. It's one of the first examples of the steel industry moving on the attack in the export-import war.

Strength and Savings — Several thousand tons of the new rebars are being used in building new missile bases where the concrete work must be strong enough to withstand an atomic attack.

Others have been used extensively in buildings where they permit huge savings by cutting the volume of concrete in columns. In turn, this allows lighter foundations and increasing the rentable floor space. Columns in Chicago's new Borg-Warner building were reduced in size by 25 pct.

In a typical building column, seven high-strength rebars will do the work of nine. Diameter of such a column can be reduced from 28 in. to 24 in. The reduction in diameter produces a savings in the amount of concrete needed. It also permits design of a lighter foundation, or increases the safety factor for the larger size.

Several Types — High - strength rebars are being produced in a 60,-000 psi yield (A 432), a 75,000 psi (A 431), and a special quality 90,000 psi which is not standard and has a negotiated price. Standard carbon bars have a yield of about 45,000 psi.

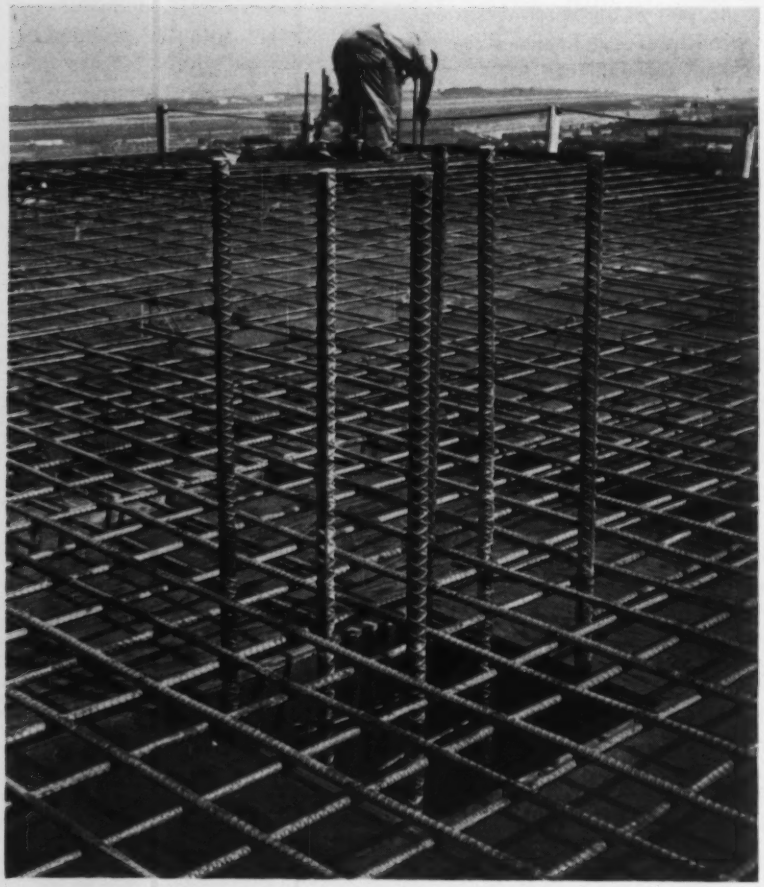
"One application with a huge potential is roadbuilding," says E. K. Waldschmidt, Republic Steel Bar Sales Manager.

"It is hoped that using the new high strength rebars, a 7-in. thick concrete road could be just as strong as 9-in. is now. The original investment is about the same, but subsequent maintenance costs drop sharply. Test sections have been built and are under evaluation."

Special Study — A special committee of the American Iron and Steel Institute has been formed and is sponsoring research at Purdue, California and Illinois universities. This will determine maximum shock loading and other pertinent data.

Rebars—about the lowest quality and cheapest steel product made —are coming to the forefront in missile work and for that matter, national defense. Yet, this is what a missile base designer in Los Angeles has to say:

Atlas and Titan—"The Atlas and Titan bases under construction are vast underground concrete complexes of domes for fuel, connecting



FEWER BARS: Improvements in high-strength reinforcing bars are leading to increased use in construction projects. Fewer bars are needed.

tunnels, and the underground silos for the missiles themselves. They are built to withstand atomic explosion as well as the force of the rocket blast-off.

"The maximum stress loading is classified information, but it's far beyond normal. The silo walls themselves are 4 ft. thick. If we had to use regular rebars, there'd hardly be enough room for the missile for all bars and concrete we'd have to pour in," he says.

Withstand Shock — The major military objection to high-strength rebars is possibility of brittle fracture under shock loading, like an explosion. But preliminary research indicates they can take a significantly higher shock load than a gradually applied one.

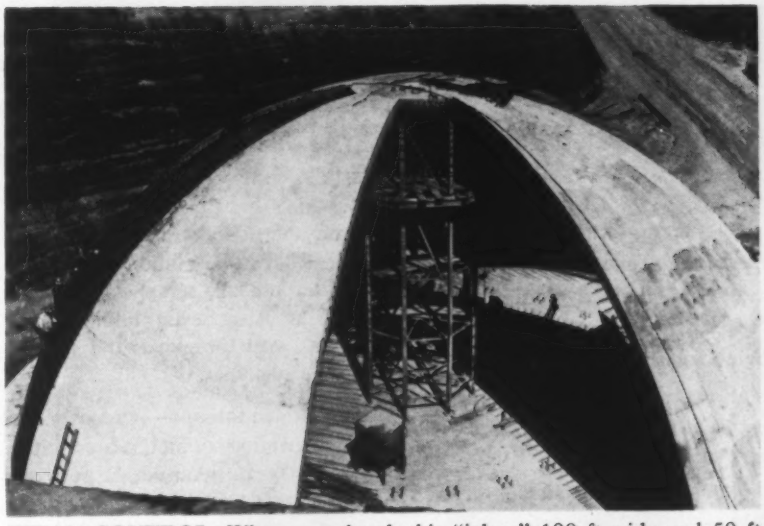
Several western rebar mills use the lowest grade of scrap as raw material. This gives them abnormally low production costs in conjunction with electric furnaces.

High-strength rebars have been made for years, but generally only on request for some special purpose —notably, bridge building. They also used to carry an extra of about $6 to $8 per ton.

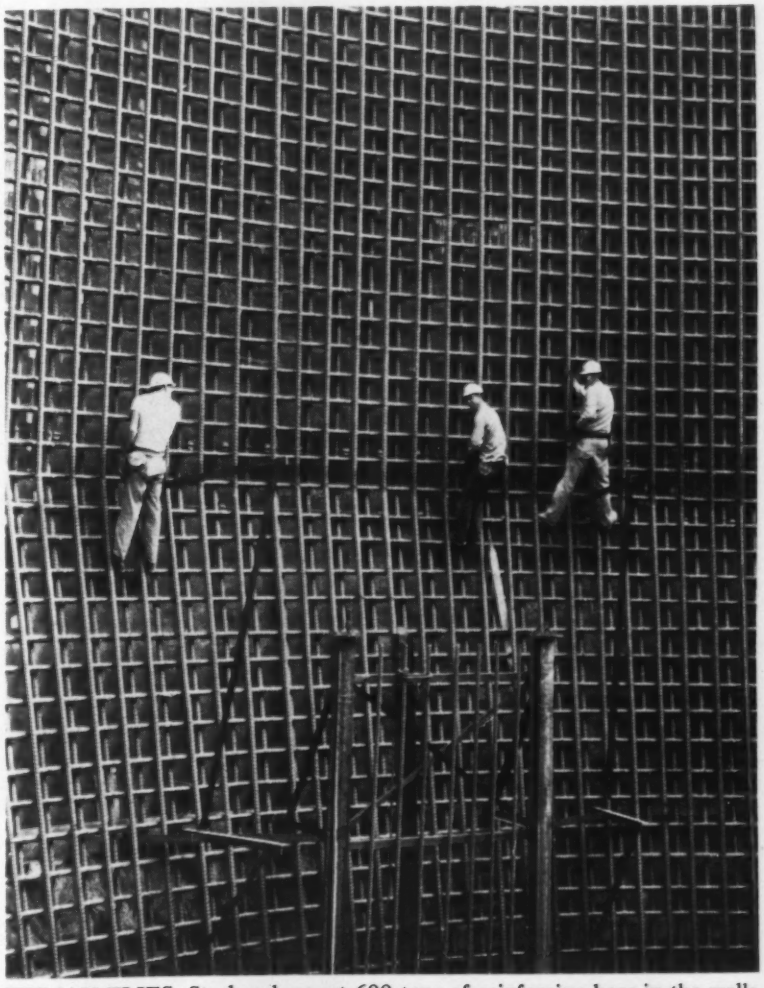
Work Improvements — Turning out the high-strength rebars is no simple trick. And improving the ductility and quality to a usable degree has taken about 2 years' work by the larger mills. Because the upper group of 75,000 and 90,000 psi bars are difficult to make, large mills feel the price will not be as susceptible to price cutting as regular rebars. They are made from new billet steel with continuous hot working.

Turning them out is mostly a matter of closely controlled chemicals, according to Harry McQuaide, Cleveland metallurgical consultant.

"Some high-strength rebars have been made with tensiles of up to 180,000 psi," he says, "but if you tried to bend them they'd break. It is possible to raise the tensile strength by air or liquid quenching the bar right off the mill or by subsequent heat treating, but this goes beyond practical limits."



TITAN CONTROL: When completed, this "igloo," 100 ft wide and 50 ft high, will house controls and brains for a Titan I missile base.



HUMAN FLIES: Steelworkers set 600 tons of reinforcing bars in the walls of a 175-ft "silo" at an Atlas missile launch facility.

Scrap Exports: Key to Market?

Strong Domestic Demand Would Boost Prices If—

The scrap market is bolstered by strong export demand. Because of limited dealer inventories, domestic interest could bring runaway prices.

But domestic interest may still be hard to find.

■ Record export demand for iron and steel scrap is now the only sustaining factor in the weak U. S. scrap market. But serious domestic interest could strengthen this market overnight. And with such a change could come runaway prices.

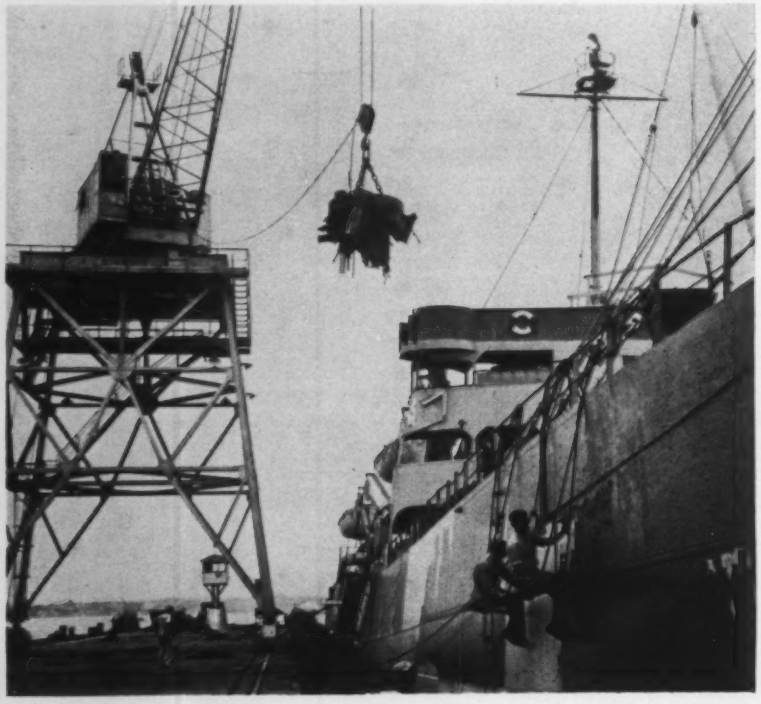
Is this likely to happen?

It's possible.

Demand from abroad—especially from Japan—has definitely given the scrap market here a needed lift. The Japanese are expected to purchase almost four million tons this year. That's one million more tha in 1960. In all, scrapmen hope to send at least seven million tons abroad with Europe as the second biggest customer.

Sustained Interest—Already there are indications that these expectations may be realized. Export interest in Detroit's No. 1 grades is being sustained. Several Japanese scrap buyers recently visited Detroit to inquire about tonnage.

Reports from Chicago note that Europeans are willing to buy as far out as July. And a deal for at least 10,000 tons was closed recently on that basis. Also, a German order is reported to have tied up fair tonnage at Milwaukee last week and the delivered German price is $48.



SUSTAINING FORCE: Scrap is loaded aboard a ship in a coastal port. Export demand has been the sustaining force for scrap dealers.

Along the East and West coasts, export orders have been the only sustaining force in the market for a number of months.

Demand Felt — Even Pittsburgh —not normally considered an export market—is feeling foreign demand. Shipments have been diverted from normal sources in New England, Detroit, and the Southwest. Railroad scrap that normally flows into Pittsburgh and Chicago is being sent to coastal points. And, of course, demand from abroad could affect Pittsburgh more directly if proposed changes in freight rates are approved.

How would this affect domestic prices?

Scrap dealers' inventories, due to the recession, auto cutbacks, and the recent bad weather, are low. Large domestic demand would definitely mean higher prices. However, it is unlikely that prices would approach the levels of 1956. That was the year when The IRON AGE composite price for No. 1 heavy melting reached $64.59 and the composite price for No. 2 bundles stood at $51.63.

Runaway Possible — Myron L. Chase, vice president, Luria Brothers, Inc., notes, "If domestic buyers come into the market for any significant amount of scrap it would definitely mean a stronger market." Regarding the possibilities of a runaway market, Mr. Chase says: "This could be."

Along the East Coast, for example, several mills entered the market for token purchases in the past two weeks. The result was a price increase of $3 in some grades.

In Chicago, some dealers started boosting unprepared scrap prices about two or three weeks ago in anticipation of increased interest. Further gains of $3 per ton are quite possible because at least three

large factory bundle suppliers are behind on scrap generation in the Chicago area.

The big question: Will domestic mills and foundries enter the market for large tonnage?

Less Export Interest—William S. Story, assistant executive vice president, Institute of Scrap Iron & Steel, predicts a decline in export interest in the next few months and a return of domestic activity. He says foreign steel prices are already dropping as the first indication of faltering demand.

On the other hand, Dept. of Commerce sources say many Japanese and European steel producers are finding expanded markets at home.

Mr. Story adds, "Big domestic scrap tonnage could not and would not happen." He says steel mills have ample hot metal capacity and the ability to use it.

This line of thought is backed up by the fact that inventories of scrap are relatively high in some Pittsburgh mills. In terms of present consumption, one mill estimates it has a scrap stockpile good for 250 days. Even at peak rates, the same mill says it has enough for 100 days.

Supply Increase—Because of the sharp increase in the supply of hot metal, another mill claims it can do without dealer scrap until the capacity rates goes over 85 pct. This, of course, isn't likely to happen soon.

It's interesting to note that some steel mills have been quietly buying scrap over the past year. And these are the companies that are loudest in the statement that more scrap isn't needed.

There is still the factor of limited dealer inventories to be considered. Even with moderate domestic demand and continued strong export demand, scrap prices could—and probably would—rise considerably.

One thing appears certain: When the St. Lawrence Seaway opens again, there will be more activity as scrap shipments head for Japan and Europe.

Consumer Price Index Will Get Face-Lift

■ How have consumer buying patterns changed in the last ten years?

To find out, the Bureau of Labor Statistics, Dept. of Labor, is launching a survey in 66 localities to find out what people buy and how much they spend.

Its aim: Modernizing and improving the Consumer Price Index — the government's official measure of changes in the prices of goods and services bought by wage earners and their families.

Three Year Job—Information for the revision will be gathered this year and next. Data for the cities involved will be published after each survey is completed. A national summary will be released when the entire study is finished. And the revised Index will be ready in early 1964.

Since the last revision of the Index in 1951, there have been many important changes in consumer buying patterns. As outlined by Ewan Clague, commissioner of Labor Statistics, these are some of the new factors:

Shifts and Changes—Population shifts from farms to the cities, within the cities themselves, and from the cities to the suburbs. In addition, there are regional shifts, mainly to the West and South.

Home ownership has increased.

Many new products have entered the market. And buyers purchase more of them in different types of stores, such as supermarkets, suburban shopping centers, and discount shops.

More and Better — Population trends have changed the market. Families are larger and people are living longer. There are now more young people and more old people in the population.

Families are buying more frozen and ready-prepared foods, joining prepaid medical care services, and wearing more clothing made of new synthetic fabrics.

How Consumer Index Is Used

Few government statistics are as important as the Consumer Price Index of the Bureau of Labor Statistics. Here are some of the ways it is studied and used:

Wage Rates — The Labor Dept. estimates the wages of over 4 million workers are adjusted according to changes in the Index through cost-of-living clauses in labor contracts. In addition, it's used to adjust royalties, pensions, and welfare payments.

Market Research—The Index provides data on the size and type of markets for products, the kinds and qualities of goods and services consumers demand, and how buying habits change.

Economic Analysis—Valuable information on consumer demand is gained by studying the index. It helps in tracing relationships between income, spending, and saving.

Forming Policy — Labor and business groups use the data in developing retirement and health programs. Government agencies study the information in forming social and economic policy.

Computer Takes English, Algebra

NEW COMPACT "BRAIN"—Ray R. Eppert, Burroughs Corp. president, uses a model of the company's new solid-state B5000 electronic computer system to point out its modular construction. With Mr. Eppert are J. R. Bradburn, vice president of manufacturing and engineering, left, and K. T. Bement, vice president, marketing. The B5000 system, the company claims, is the first designed to accept programs written in English language statements for business problems, and in algebra for scientific problems. Automatic operation is another feature.

U. S. Won't Interfere With '61 Auto Talks

In Detroit, Labor Secretary Arthur Goldberg said the Federal government won't get involved in auto industry negotiations this year. He told this to a gathering of high-ranking labor, management and government officials.

Mr. Goldberg's statement apparently was aimed at easing fears of management officials. Some are concerned the Administration might try to move into the negotiations as a "public representative."

Speaking of the President's Advisory Council on Labor-Management Affairs, he said it isn't a "dispute-settling agency" designed to interfere with collective bargaining. "Its purpose is to make studies, advise, and recommend to the President policies to promote industrial peace, encourage productivity, promote sound wage and price policies."

Federal R&D Spending Jumps to $9.1 Billion

The Federal Government will budget an estimated $9.1 billion for scientific research and development during fiscal 1961, according to the National Science Foundation.

The estimate includes $8.5 billion to conduct research and development and $600 million for R&D plants and equipment. About $850 million, or 10 pct of the total R&D budget, is marked for basic research.

The $9.1 billion total compares with $7.4 billion in 1959 and $8.6 billion in 1960. In fiscal 1960, funds of $747 million for basic research represented over 9 pct of the total. Forty-four pct of basic research total went to educational institutions, 30 pct to Federal agencies, 14 pct to profit organizations, and 12 pct to other performers.

Texas Eastman Starts Polypropylene Plant

Texas Eastman Co. has opened a new polypropylene facility at Longview, Tex. It will produce 20 million lb annually.

The Longview plant, which also produces polyethylene, is in the heart of the propane-rich gas fields of eastern Texas. Newest of the plastics, polypropylene has desirable properties for injection and blow molding, and for extrusion into film and monofilament.

Repeal Right-to-Work?

Congress is being pressured by labor unions to repeal Taft-Hartley Act provisions supporting Right-to-Work laws. But the lawmakers are fearful that repeal would open the floodgates on more proposals to change the labor law. Unions will get Administration backing for repeal, but lack support in Congress.

Huge Sphere is Theme Of N. Y. World's Fair

A 13-story stainless steel sphere will be the theme symbol of the 1964-65 New York World's Fair.

Known as Unisphere, it will represent Earth, with the continents in raised mesh outline and with surrounding orbiting "satellites." It will be fabricated and erected by American Bridge Division of U.S. Steel Corp. in almost the precise place of the Trylon and Perisphere of the 1939-40 fair.

The massive armillary sphere will be 120 ft in diameter and over 135 ft high.

Automation Division

Dept. of Labor is setting up a new division to deal with automation. It is the outgrowth of concern over automation problems expressed by President Kennedy and Labor Secretary Goldberg. Both believe automation can be blamed for part of the unemployment problem.

INDUSTRIAL BRIEFS

Better Control—A new industrial process control computer business, formerly part of the Computer Dept. at Phoenix, Ariz., will be assigned to General Electric Co.'s Industry Control Dept. Growth of both businesses led to the move.

Automation Step—General Electric Co. is forming one organization of all its market development and advanced engineering activities for the automation of industrial processes. It will be called the System Sales and Engineering Operation, with headquarters in Schenectady.

Manganese Move — Work has started on American Potash & Chemical Corp.'s new $5 million manganese metal plant at Aberdeen, Miss. The new facility is American Potash's first full commercial manganese metal operation.

Southern Spread—Westinghouse Electric Corp. is supplying electric appliances, heating and air conditioning units for a $100 million home development project in Bradenton, Fla. The Westinghouse portion of the contract could total $3.75 million, depending on the number of houses built.

New Layout—Diebel Die & Mfg. Co. has moved to a new plant in Morton Grove, Ill. The quarters cover 35,000 sq ft of floor space.

Glidden Deal—The Glidden Co. has acquired the metals division assets of The Crane Co., Johnstown, Pa. The new facilities join the metals department of Glidden's Chemicals Div.

All-Steel Skin — A new all-steel building will house two new electric welded tube mills of Ohio Seamless Tube Div. of Copperweld Steel Co. It is part of a $3 million expansion and improvement project at the Shelby, O., plant.

Pact for Plant — Air Reduction Sales Co. will build and operate a tonnage oxygen plant for Bethlehem Steel Co. to supply Bethlehem's blast furnaces at Johnstown, Pa. The $5 million project will allow production capacity of 675 tons of oxygen per day.

Satellite Work — Baird-Atomic, Inc., Cambridge, Mass., has been awarded a $2 million contract for a reliability testing program for the MIDAS satellite by the Missiles and Space Div. of Lockheed Aircraft Corp., Sunnyvale, Calif. Lockheed is prime contractor to the U. S. Air Force for the MIDAS program.

Western Buy—Arthur G. McKee & Co., Cleveland, has acquired the Western Machinery Co., San Francisco. Purchase price was $8.44 million. The company will operate as a wholly owned McKee subsidiary.

Largest Grows — Consolidated Aluminum Corp., Jackson, Tenn., has acquired AIAG Metals, Inc., New York City. Consolidated is the largest domestic producer of super purity aluminum.

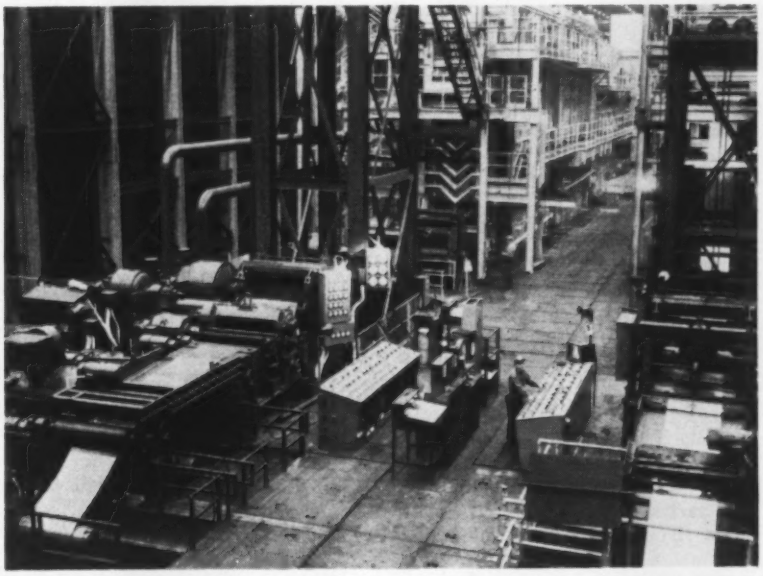
New Name—Tubular Micrometer Co., St. James, Minn., is now fully integrated with George Scherr Co., Inc., New York City. The corporate name has been changed to Scherr-Tumico, Inc., with headquarters at St. James.

Tool Rights — Van Norman Industries, Inc., New Bedford, Mass., has acquired rights to a new multipurpose drilling and tapping machine. Marketed under the name "Versi-Matic", it will be made and sold through the Van Norman Machine Co., Springfield, Mass.

On Its Own — Chase Brass & Copper Co., division of Kennecott Copper Corp., has formed a Rhenium Division. Chase rhenium sales jumped 400 pct in four years.

Birthday Prize—Famed architect Ludwig Mies van der Rohe received the J. Lloyd Kimbrough Medal of the American Institute of Steel Construction, Inc. on his 75th birthday. Over 50 members of the Chicago chapter, American Institute of Architects, honored the founder of the "Miesian" school of architecture.

New Annealing Line Joins Another



SECOND FOR WEIRTON: New continuous cleaning and annealing line in the tin plate department of Weirton Steel Co., Weirtown, W. Va., is pictured from the delivery end. The first such line is shown at right. The new line handles 60,000 lb coils of cold rolled strip steel up to 45 in. wide in tin plate gauges, at speeds up to 2000 fpm.

. . . Stacks of Nestaway racks show nesting, interlocking and space-saving features of racks for baked goods handling made by Mid-West Metallic Products for its affiliate, Nestaway, Inc. Rack held by Harold W. Vetter (left), Mid-West director of manufacturing, and Robert J. Adams, purchasing agent, holds 12 loaves of bread and stacks 12 high on castered base. Rack uses up to 13.3 pounds of Pittsburgh Steel Co.'s bright basic wire.

DELIVERING BREAD—BY WIRE

Pittsburgh Steel wire's uniform welding, forming properties give Mid-West Metallic extraordinary success in the manufacture of Nestaway racks

Bread and pastries are delivered better by wire. That is, by welded steel wire racks that perform double duty in handling and selling baked goods.

Mid-West Metallic Products, Inc., a fast-growing subsidiary of Rubbermaid, Inc., uses Pittsburgh Steel Company's bright basic wire to build wire shipping racks for its affiliate, Nestaway, Inc., another Rubbermaid subsidiary. In addition to the Nestaway racks, Mid-West makes more than 300 other wire formed products, using Pittsburgh Steel's bright basic and galvanized wire in a wide range of sizes.

The Nestaway racks, however, are a prime example of Mid-West's experience in using Pittsburgh Steel's .3625 and .3065 bright basic wire.

The racks are part of a complete Nestaway system for baked goods handling to and at the point of sale. The system includes interlocking wire racks, rack shelves and caster bases. It eliminates nearly all direct handling of baked goods between bakery and consumer.

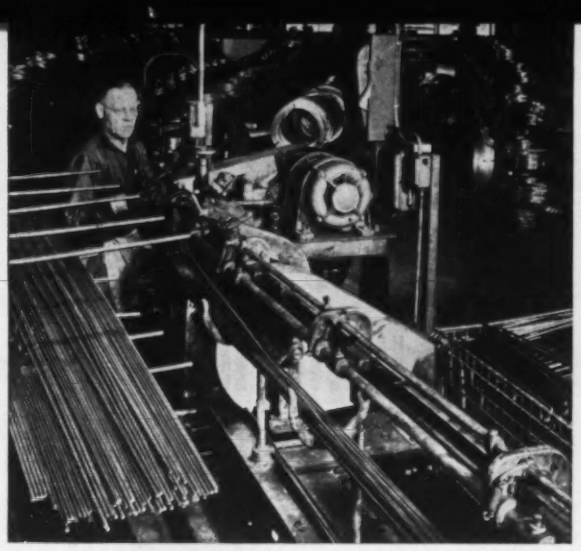
To build the Nestaway racks, Mid-West uses automated and semi-automated forming and welding equipment of its own design. This equipment requires wire with the highest possible uniform physical properties. Mid-West depends on Pittsburgh Steel for much of its wire supply because it is assured consistent, uniform quality.

• **Phenomenal Welding Success** —Made in 11 sizes ranging from 8.4 to 13.3 pounds in weight, an average Nestaway rack requires 200 welds.

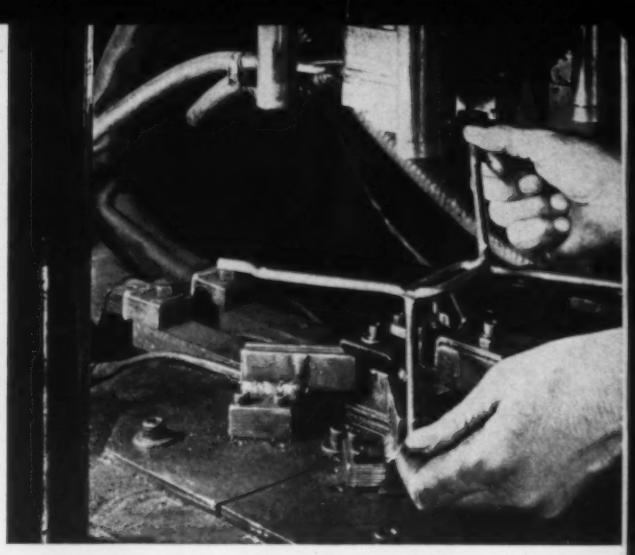
On welding, Harold W. Vetter, Mid-West's director of manufacturing, says:

"In all of our production last year, we had an extraordinarily low number of broken welds. We've had racks returned that had been accidentally crushed by trucks—but the welds were seldom broken."

Purchasing Agent Robert J. Adams adds further evidence of the



. . . **From straightening and cutting** through final copper-nickel-hard chrome plating, Pittsburgh Steel's wire meets Mid-West Metallic's requirements for consistent uniformity of forming, welding, coating properties.



. . . **Key piece of rugged Nestaway rack**—the bends and welds on "X"-shaped side supports are produced to tolerances of plus/minus .015 inch by Mid-West Metallic with Pittsburgh Steel's .3625 bright basic wire.

weldability of Pittsburgh Steel's bright basic wire, saying:

"We found Pittsburgh Steel wire would consistently hold welds when we bend the welded ends of the rack's bottom frame to form Nestaway's interlocking feature."

• **Close Forming Tolerances**—Because Nestaway racks are built to stack when loaded and nest precisely when empty, wire bends are made to unusually close tolerances. Mr. Vetter explains:

"This rack is so accurately formed that it's practically a machined product. Every bend—even over-all dimensions and some welds—is held to a tolerance of .015 inch."

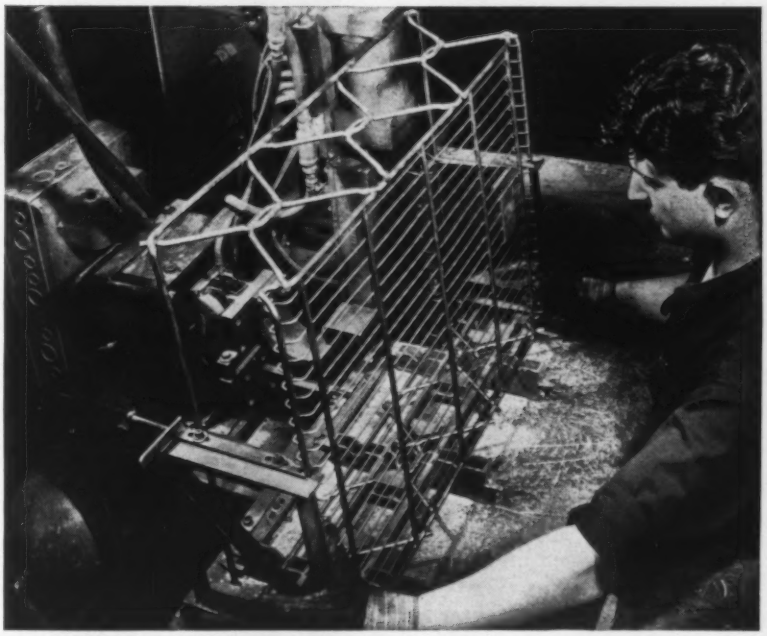
Surface finish of Pittsburgh Steel's wire is vital, too. After assembly, the rack is given a copper-nickel-hard chrome coating to provide a durable, attractive unit which meets strict standards of cleanliness.

Pittsburgh Steel's ability to supply wire with the consistent quality Mid-West Metallic requires is testified to by Purchasing Agent Adams. He says:

"Pittsburgh Steel furnishes us quality wire with uniform properties from shipment to shipment. Otherwise, we're in trouble on our automatic machines. We want wire that is weldable, formable and clean.

"Pittsburgh Steel has been able to give us what we want with consistency and we're extremely satisfied with the way its wire performs for us."

Take a lesson from Mid-West Metallic's experience. The benefits this progressive company gets from using Pittsburgh Steel's wire can be yours, too, whatever your application. Just contact one of the district offices listed at the right.



. . . **With 200 welds per rack** and a present capacity of more than 25,000 Nestaway racks per month plus component parts of the Nestaway System, Mid-West Metallic experiences very few broken welds in the course of a year. Credit goes to efficient equipment and wire quality. Nestaway rack is shown here in assembly before chrome plating. Mid-West, a subsidiary of Rubbermaid, Inc., looks to Pittsburgh Steel for bright basic wire and plain galvanized wire to make Nestaway racks and more than 300 other products at the new Cleveland, Ohio, plant.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

Steel

Which billet will give you uniform forged parts at lower cost ?

Make all the tests you want, but you still couldn't determine which of these forging billets is better. Reason: They're both Timken® fine alloy steel, as uniform as billets can be from length to length, from order to order. And it's this exceptional uniformity that saves you costly interruptions to make adjustments in your forging operations. Your forged parts are uniform. Your costs are lower.

You can be sure of uniformity in Timken steel because of our quality control, individual handling of your order, thorough, careful inspection. For the most for your money in your modern forging operations, specify Timken steel forging billets. And for expert help on your steel problems, call or write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.

TIMKEN®

***Fine Alloy* STEEL**

Some Interest Rates May Drop

Toughest money issue in Washington is how to reduce long-term interest charges without affecting short-term rates.

Some changes are possible. But limiting the reaction will be difficult.

■ As a businessman, interest rates influence your actions both as a borrower and a creditor.

If long-term rates are high, they may discourage business borrowing for capital improvements and expansion. If short-term rates are low, they reduce the amount your company earns on funds in the bank.

Administration's Problem—You have a large stake, then, in current decisions involving the level of rates. To pep up the economy, the Kennedy Administration wants to reduce long-term interest rates. At the same time, it's necessary to limit declines in short-term rates.

Unattractive short-term rates for investors are one of the factors adding to the gold drain on the U. S. When short-term rates are higher elsewhere, investors withdraw funds or search for more attractive investments. This has caused foreign investors to pull funds from the U. S.

The aim in Washington is to hold up short-term rates while dropping long-term rates to stimulate business. The big question: Can it be done?

Kennedy's Views — In his economic message President Kennedy outlined the problem very clearly. "In these circumstances," Mr. Kennedy said, "monetary policy and debt management must serve two apparently contradictory objectives:

"First, checking declines in the short-term rates that directly affect the balance of payments. Second, increasing the flow of credit into the capital markets at declining long-term rates of interest to promote domestic recovery."

"These two objectives can be achieved concurrently, but only with close cooperation among all governmental agencies concerned," he continued.

It's easy to see why the problem is a tough one, if you review the sources and uses of both short-term and long-term borrowing.

Who Borrows What? — Prime borrowers of short-term funds (maturing in less than a year) are the big commercial finance companies and the U. S. Treasury. Both are interested in funds for current expenses. The main suppliers of short-term funds are commercial banks, business investments, and foreign banks and investors.

Long-term borrowings (maturing in 5 years and up) are sought by corporations interested in capital expansion, and by governments, Federal, state, and local. The main sources of long-term funds are savings banks, insurance companies, pension funds, and related investment groups.

. . . But Action Means Reaction

■ Is it possible then to change one rate without influencing the other? Economists questioned by The IRON AGE indicate it's probable that one rate might be raised or lowered to a degree, while the other is kept constant. "But," one economist adds, "you must remember these rates don't exist in separate, water-tight compartments. They are inter-related."

Discouraging Incentive—For example, if long-term rates are lowered, there will be less incentive for investors for that area. Funds for borrowing would then be diverted —possibly into the short-term market. The short-term rate would have to be influenced if this happened.

Any flow of funds away from the long-term market would, by itself, act as a brake on downward movement of long-term rates. As the funds dried up, increased demands by borrowers, would act to hold rates steady or even push them up.

Short vs. Long—On the other hand, efforts to keep short-term rates firm will affect long-term rates. Good short-term rates would attract investors normally interested in the long-term market. And, again, the movement would help keep long-term rates up.

One solution as far as short-term foreign funds are concerned: The Kennedy proposal to allow U. S. banks to pay higher interest rates for deposits of foreign governments than for domestic depositors.

VALUE ANALYSIS FACT SHEET

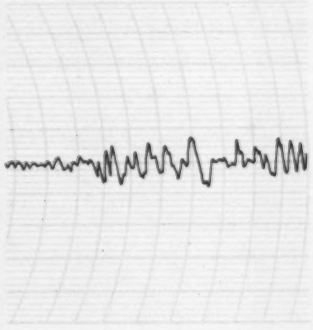
Formbrite Drawn Brass Parts

How to open finishing room bottlenecks and cut polishing costs up to 50%—produce stronger, more scratch-resistant parts—and get additional savings—with Formbrite, superfine-grain drawing brass.

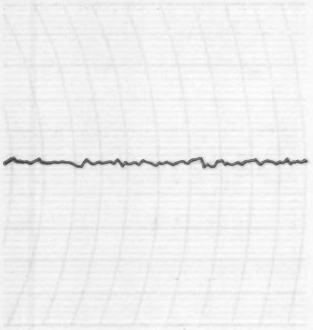
Very often in the production of drawn brass parts which are to be plated or lacquered, finishing costs are greater than those of all preceding operations—or even the cost of the metal. Under any circumstances, they are a high percentage of total costs.

Furthermore, parts go through the pressroom a lot faster than they can through the finishing room, creating bottlenecks in production.

ENLARGED SURFACE TRACES at the right prove that you can lick both cost and time problems with Formbrite®, Anaconda superfine-grain drawing brass. Savings in polishing costs reported by users run from 40 to 50%. These are net savings, as Formbrite costs no more than ordinary drawing brass.

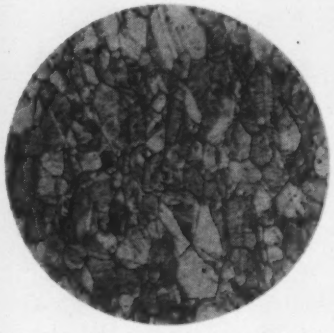


Enlarged surface trace of standard drawing brass (grain size, .045 mm) after 40% elongation. This kind of roughness causes "orange peel" effect in the working of standard drawing brass. Smoothing such mountains down to the valleys takes considerable cutting.

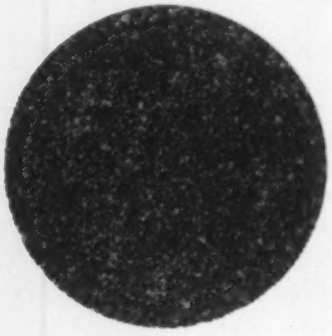


Enlarged surface trace of Formbrite drawing brass (grain size, .005 mm) after 40% elongation. Surface smoothness after deformation is the test of a drawing brass's polishing characteristics. It is relatively easy to level these little hills on the surface of Formbrite. In many cases, users find they eliminate cutting operations altogether, need only a simple color buff.

STRONGER, MORE SCRATCH RESISTANT. Formbrite is stronger, harder, springier than the usual drawing brasses in the same standard tempers, yet retains remarkable ductility for forming and drawing, and takes sharp, clean-cut ornamental die impressions. The harder surface means fewer rejects from scratching and marring during handling. In some instances, the superior strength and hardness of Formbrite make possible the use of a thinner gage metal, with an additional saving in material cost.



This is the microstructure, shown 75x, of the standard drawing brass used above.



This uniform superfine-grain structure of Formbrite, shown 75x, is produced by special procedures for rolling or drawing and annealing developed by Anaconda American Brass Company.

SIZES AND TEMPERS. Brass manufactured by the Formbrite method, with its special characteristic of superfine-grain structure, is supplied in standard Formbrite temper, half-hard, three-quarter-hard, hard, and extra-hard tempers, and can be rolled in heavy coils to .004" in thickness by 24" wide, weighing 100 pounds per inch of width. The table below gives physical data and terminology for Formbrite tempers.

ALLOYS. In addition to 70-30 brass, the following Anaconda alloys also are produced by the Formbrite method: Yellow Brass-59, Gilding Brass-4, Commercial Bronze-14, Red Brass-24, and Low Brass-32.

TECHNICAL ASSISTANCE. For help in selecting the alloy and temper to handle your particular job—for a copy of Publication B-39 with more details about Formbrite—see your Anaconda representative. Or write: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

6143

TERMINOLOGY FOR FORMBRITE TEMPERS

TENSILE STRENGTH LB. SQ. IN.		ROCKWELL B HARDNESS		DESIGNATION TO BE USED
MIN.	MAX.	MIN.	MAX.	
49,000	59,000	40	65	Yellow Brass—Formbrite
57,000	67,000	60	77	Half-hard Yellow Brass—Formbrite
64,000	74,000	72	82	Three-quarter-hard Yellow Brass—Formbrite
71,000	81,000	79	86	Hard Yellow Brass—Formbrite
83,000	92,000	85	91	Extra-hard Yellow Brass—Formbrite

FORMBRITE

Superfine-grain drawing brass

a product of

ANACONDA®

Anaconda American Brass Company

Plastics Have Designs on Cars

Materials Use May Go up as Costs Go Down

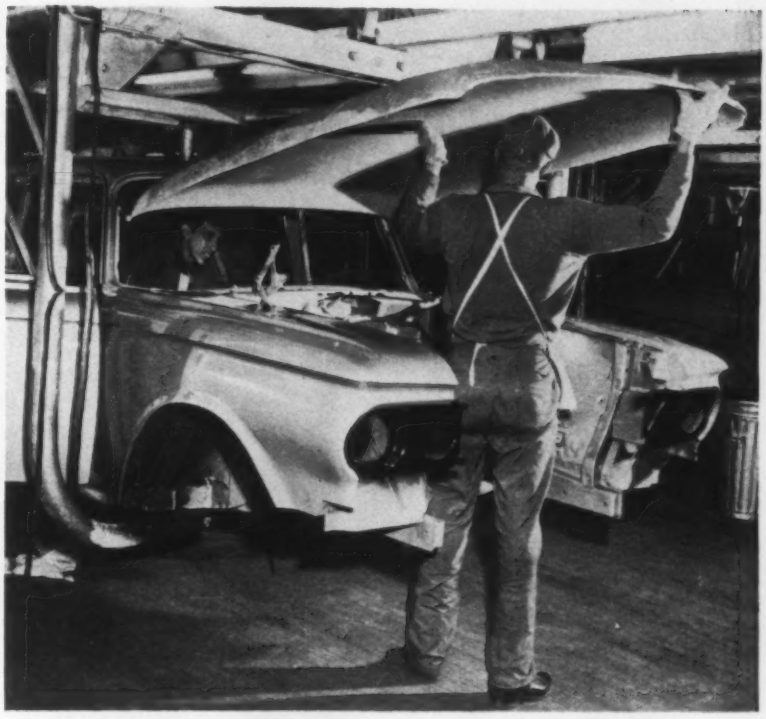
Plastics makers see greater use of their materials in cars as costs decrease.

One plastics man looks far ahead and sees new developments ranging from entire bodies to power and electrical systems. By A. E. Fleming.

■ Is there a plastic car in the automotive future?

From Chicago last week came ideas for increased use of plastics in automaking. At the Reinforced Plastics Conference, I. J. Gusman, manager of the Industrial Glass Fabrics Dept., J. P. Stevens Co., did some long-range forecasting on the subject.

Mr. Gusman claimed it's possible to build 25,000 fiberglass car bodies before higher material and fabrication costs, compared to steel, overcome tool savings.



SNAPS INTO PLACE: One-piece phenolic-glass headliner being installed in a 1961 Rambler provides improved thermal and sound insulation.

Far Above Estimate—This is far above the 10,000-12,000 annual figure The IRON AGE was told is the level at which it becomes cheaper for Chevrolet to switch from plastic to steel for Corvette bodies. The present body is 70 pct glass and 30 pct plastic.

Mr. Gusman's 25,000 figure indicates the break even point for plastic bodies is rising. The point jumps a notch every time resin and glass prices go down, steel prices go up or plastic processing improves.

This isn't to say steel producers need fear plastics taking over the body department. That time might never come. At present, a 25,000 volume is barely enough to keep an automaker in door handles unless it's a specialty product.

Fighting Limitations—Reinforced plastics makers are toiling to overcome their volume limitation. The point they're pounding out: Reinforced plastics can reduce the number of parts needed in cars.

"A plastic heater duct can be molded in fewer pieces than metal," says Mr. Gusman, "and we save money on assembly."

Rambler came up with a large blow-molded defroster duct on 1960 models. Then there's the 1961 Rambler phenolic - glass headliner, which replaces framing, fastening, insulation and fabric. It can be snapped easily into place and is said to improve sound insulation.

"Here the cost per pound of resin and glass, the slow molding cycle and labor cost per unit were overcome by design advantages of the plastic piece," says Mr. Gusman.

Some Possibilities—Looking far ahead, Mr. Gusman came up with these possibilities for tomorrow's transportation:

Power Systems — The fuel cell, solar battery, gas turbine, thermionic converter, nuclear energy, solid fuels and plasma jet would demand high-strength, high temperature resistant materials.

Electrical Systems — Distribution of electrical power through the body, electro - mechanical generators, relays and other circuit devices might be carried out as solid-state reactions within materials molded into a plastic body.

Modern board forging hammer

DEPENDABILITY of shifter fork improved by designing it to be FORGED

By designing the shifter fork of his transmission to be forged, a manufacturer of earthmovers eliminated costly equipment breakdowns in the field because of fork failure. Factor of safety was *in*creased even while weight and over-all costs were being *de*creased.

Parts scrapped because of voids uncovered after much high-cost machining are eliminated . . . forgings are *naturally* sound all the way through. Forgings start as *better* metal . . . are further *improved* by the compacting hammer-blows or high-pressure of the forging process.

Design your parts to be forged . . . increase strength/weight ratio, reduce as-assembled cost, improve performance. Literature to help you design, specify, and procure forged parts is available on request.

When it's a vital part, design it to be FORGED

Drop Forging Association • Cleveland 13, Ohio

Names of sponsoring companies on request to this magazine

Defense Switch Feelings Mixed

Missile Makers Fear Some Program Phase-Outs

Planemakers and Polaris contractors welcome the President's revamped defense policy.

But some West Coasters figure the call for less duplication in missiles could mean quick phaseouts for some projects.
By R. R. Kay

■ President Kennedy spelled it out: More modern troop transport planes; less overlap on missile projects; and a hefty push for the Polaris submarine program.

Some West Coasters greeted this policy with mixed feelings.

It seems sure to be a blessing for planemakers. And at a time when employment is still falling and profits are down.

Modern transports for fast logistic support mean one thing: Jets. That points to Boeing 707's, Convair 990's, and Douglas DC-8's.

New Type Plane—And it could mean a crash program for a new-type cargo plane. If so, all the major West Coast builders will be in there pitching for the business. That means Lockheed and North American Aviation, too.

Right now, Douglas DC-6's and 7's and Lockheed Constellations carry the bulk of the military transport load. They use conventional reciprocating engines. They're slow and costly to operate.

Polaris Blessings — The President's big sendoff for the Polaris submarine program means a tremendous amount of business for years to come. And more work for thousands of U. S. suppliers.

Lockheed is jubilant. It's the prime contractor for the Polaris.

Missile Changes—But gains in transport plane and Polaris contacts could be offset by changes in other missile programs. Just how much is hard to tell at the moment.

President Kennedy's call for less duplication in missiles could mean: (1) a fast axe on some big-money projects; and/or (2) a quick phase-out on some missiles.

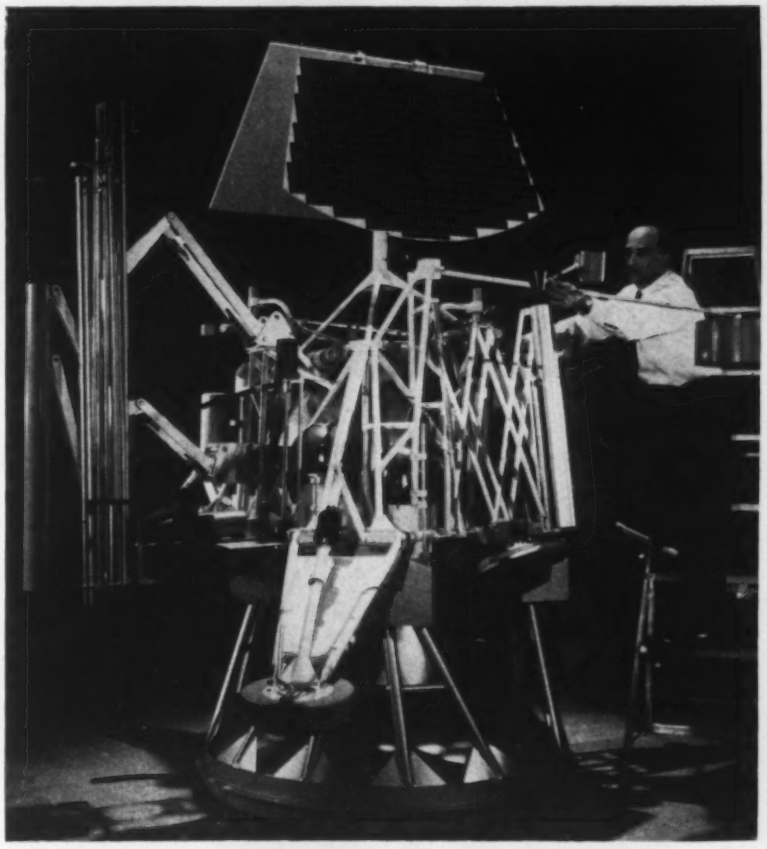
Either way, it would lop off impressive backlog figures.

Coal Goes to Japan

Coal is moving from Washington to Japanese steel mills. A multi-million-dollar contract calls for 800,000 tons to reach Japan in a four-year period.

Here's the deal: Mount Rainer Coal Co. is to ship the coal from its mines at Wilkeson, Wash., to a Mitsubishi steelmaking subsidiary in Japan.

It Will Probe the Moon and Report



MOON DETECTIVE: Dr. Leo Stoolman, manager of Hughes Aircraft Co.'s Surveyor Lab, makes adjustments on a full-scale model of a Surveyor spacecraft's payload. It is designed to make a soft landing on the moon and report what it finds. Hughes will make seven for NASA.

Quality . . . the best economy of all

Electronic parts courtesy Judson Mfg. Co., Inc., Cornwells Heights, Pa.

Mirror-bright without polishing, after switch to Sunicut

Boring on a multiple-spindle automatic produced the finish you see on these electronic parts. Sunicut 102-S Cutting Oil saved time and money by eliminating the polishing operation. The same automatic uses Sunicut 102-S to machine metals ranging from titanium to stainless 410.

Sunicut 102-S is one of a full line of cutting oils known throughout metalworking for maintaining long tool life, close tolerances, and fine finishes. There's a grade of Sunicut that can help you improve your product quality—and *that's* the best economy of all.

To choose the right Sunicut, ask the Sun man; that's part of his service to you. Or write to SUN OIL COMPANY, Dept. IA-2, *Philadelphia 3, Pa. In Canada: Sun Oil Company Limited, Toronto and Montreal.*

SUNOCO

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

One-Machine Shop Speeds Work

A Machine Shop Built Around a Single Machine Pays Off

The idea of building a business around one production machine is paying off for two companies.

In each case, highly automated equipment is able to do special work at much lower costs.
By R. H. Eshelman

■ An entire job machine shop built around a single, high speed multi-purpose tape controlled machine is becoming a reality.

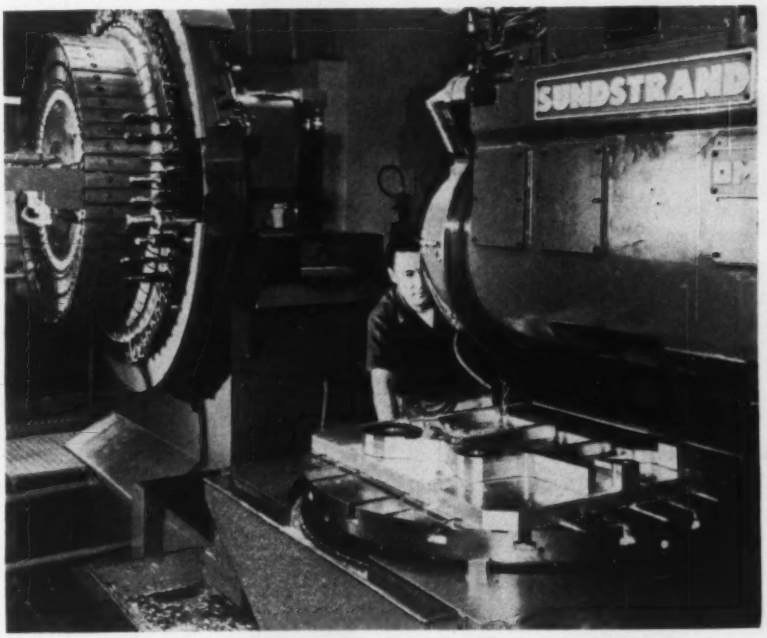
A Cleveland company, Numerical Machining, Inc., started operation recently with the first Sundstrand Omnimill ever built. Business is so good that a second is now being installed.

This is a new 5-axis combination boring, drilling and milling machine. It's the first of its type with a 360° rotating head. And it is reported to handle work at about 80 pct of normal machining costs.

Shows Promise — A California shop, Mill-A-Matic Machining Inc. in Santa Ana, a Los Angeles suburb, uses another highly automated machine. It has the Kearney & Trecker Milwaukee-Matic as its sole production piece. This was introduced earlier and over 100 are in use around the country.

The Cleveland company is still getting into operation, but it has already shown major promise of its potential. It has operated two shifts steadily since opening. Jobs have come in from as far as the East Coast, South and St. Louis—some urgent ones by air.

Fast Work—"We are delivering finished parts in the time it normally takes to make patterns," says Richard Stitt, general manager. "On a few special pieces, where this machine can really do its stuff, we have had phenomenal results. On an 8-casting assembly for a gear case, we have quoted the tooling for $4800 where the nearest competitive bid was $67,000.



DOES IT ALL: Bracket for mobile missile launcher is profiled in a hurry by this Sundstrand Omnimill, only production unit in the shop.

"We made a 14-in. dia. hydroform steel die for one urgent job in one day when the customer was being quoted two weeks for keller patterns alone and three weeks for the finished die. We also made four heat exchanger plates in a quarter the time it would take on a jig borer because this new unit positions so fast. The plates were 38-in. dia. and had 572 holes of 1-in. dia. each."

Small, But Versatile—The holes (in stainless and titanium plate) required 7 tools each. The machine positions at a speed of 200-in. per minute. It ran through all the holes 7 times with a new tool each time. It cut the time by about 75 pct and stayed within tolerance.

Despite its small size, this new type machining center can handle as wide a variety of jobs as shops 10 or 15 times its size. It also has the first "Director" tape control system built by Dage Div. of Thompson Ramo Wooldridge.

The tape machine and control will do kellering, profiling without templates, drilling and reaming automatic tapping and milling. It produces tracer and profile templates, cams, and multiple-hole piercing dies, forging dies and multiple-hole bushing plates.

J. J. Anderson, named vice president, marketing, Diehl Manufacturing Co., Finderne, N. J.

Union Carbide Corp. — **H. D. Kinsey,** elected a vice president; **P. L. Alspaugh,** appointed president, Union Carbide Olefins Co., a div. of the Corporation.

The Yoder Co.—**E. L. Mackey,** appointed vice president, engineering; **E. A. Koenig,** as vice president, sales, and **T. R. Stroomer,** as sales manager.

Fairbanks, Morse & Co.—**L. W. Fitzgerald,** appointed asst. to the president.

Screw & Bolt Corp. of America —**H. S. Monheim** and **G. H. Hodapp,** appointed assistants to the chairman; **I. J. Berkman,** appointed executive vice president, sales.

USI Robodyne Div., U. S. Industries, Inc.—**J. D. Goodell,** appointed president and general manager.

Chapman Valve Manufacturing Co. — **David McIntosh,** appointed vice president, sales, Indian Orchard, Mass.

Sharon Steel Corp. — **J. W. Byrne,** promoted to manager, marketing hot rolled products; **R. E. Douglas,** promoted to manager, marketing special coated steels; **W. A. Garrett,** promoted to manager, marketing Brainard Strapping; **D. W. Meyer,** promoted to manager, marketing cold finished and coated products.

Arwood Corp.—**F. W. Dischinger,** appointed plant manager, LaVerne, California plant; **Leland Hargraves,** appointed plant manager, Los Angeles, Calif., plant; **George Main,** appointed Eastern Div. sales manager, New York.

Holcroft & Co.—**E. C. Bayer,** appointed technical director.

J. K. Rye, elected president, F. Jos. Lamb Co., Detroit.

Aluminium Limited Sales, Inc. —**W. G. L. Murphy,** appointed Los Angeles district sales manager.

Parts and Accessories Div., Wagner Electric Corp.—**E. H. Reichel,** appointed manager, New York Parts and Accessories branch office; **J. P. Miller,** named manager, Boston office; **B. J. Wheat,** named manager, Cincinnati branch.

Air Reduction Sales Co.—**J. P. Casalis, Jr.,** appointed St. Louis district manager.

Data Processing Divisions, Consolidated Electrodynamics Corp.— **S. R. Wyzenbeek,** appointed manager, marketing operations.

ALCO Products, Inc.—**Dr. W.**

(Continued on P. 86)

E. R. Zeek, appointed vice president, research and engineering, Diehl Manufacturing Co., Finderne, N. J.

Sidney Throne, appointed vice president, Atlantic Aluminum & Metal Distributors, Springfield, Mass.

J. W. Lenehan, named vice president and director, engineering, Air Pollution Control Div., John Wood Co.

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This ALL-NEW SUPER HIGH SPEED STEEL Band Saw Blade

comes welded-to-length . . . ready to use . . . in striking, new package with cutting edges protected by a special plastic cover.

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The biggest advance ever in metal cutting band saw blades — that's Simonds *SUPER* High Speed Steel Metal Band Saw. No matter what ferrous metal you're band sawing, this brand new blade will give you *up to 3 times better performance* than any High Speed Steel blade you're now using!

This is not just a claim but a provable fact backed by Simonds' established reputation as a leading manufacturer of industrial cutting tools.

This *SUPER* High Speed Steel Band is an entirely new concept in band saws . . . new steel*, new manufacturing methods, new heat treatment, new welding techniques, new final inspection.

Laboratory and field tests demonstrate that this new saw is so much better in every way for production cut-off work that we are offering it on a PERFORMANCE GUARANTEED basis! You can't lose — you can cut your blade costs, save on down time, get the equivalent of up to 3 saws in better performance *at a cost of only 10% more than ordinary High Speed Steel blades.*

The sooner you try this new blade, the more you'll save! Get prompt delivery now of Simonds *SUPER* High Speed Steel Band through your Simonds Industrial Supply Distributor or your nearest Simonds Branch.

*Developed and made in Simonds own Steel Mill — Patent Applied For

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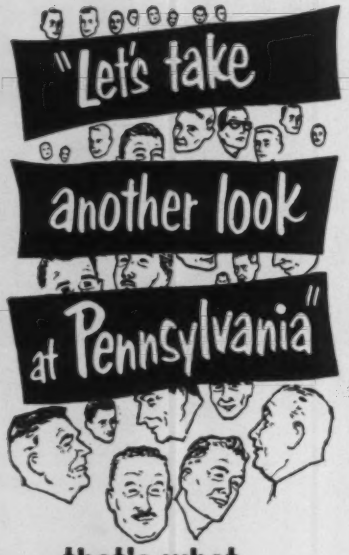

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South Office Building
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(Continued from P. 84)

J. Stromquist, appointed resident manager, SM-1 nuclear power plant at Fort Belvoir, Va.

Heiland Div., Minneapolis-Honeywell Regulator Co.—**W. D. Owens,** appointed general manager.

Wolverine Tube, Div. of Calumet & Hecla, Inc.—**E. W. Ervasti,** appointed asst. director, marketing.

Gus Keulemans, elected executive vice president, The American Screw Co. Div., Noma Lites, Inc.

Marketing Div., Square D Co. —**W. R. Clarke,** appointed product manager.

The National Copper & Smelting Co.—**R. B. Flynn,** appointed sales manager.

Volco Brass & Copper Co.—**R. T. Kiefer,** appointed general sales manager.

Dr. W. A. Bittenbender, appointed corporate director, research, The Glidden Co.

I. D. Carson, appointed manager, product and market development, Weirton Steel Co., Div. of National Steel Corp.

Westinghouse Air Brake Co.—**Dr. J. E. Parks,** appointed director, marketing research and manpower development.

Nickel - Alkaline Battery Div., The Electric Storage Battery Co.—**W. W. Smith,** named manager, engineering and development, West Orange, N. J.

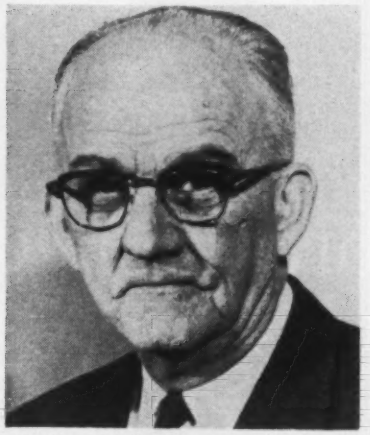
The Carpenter Steel Co.—**R. L. Mogel,** appointed asst. metallurgist, technical services.

A. P. G. McGinnes, Jr., appointed manager, product development, The Beryllium Corp.

General Electric Co. — **E. S. Reeser, Jr.,** appointed district manager, steel sales, Pittsburgh area.

Doehler - Jarvis Div., National Lead Co.—**J. R. McClurken, Jr.,**

named asst. plant manager; **P. W. Marshall,** becomes superintendent, Aluminum Div.; **W. H. Guldin,** has been designated general foreman, Zinc Div.



H. C. Sproule, named division manager, Hydraulic Div., Reading, Pa., Birdsboro Corp.

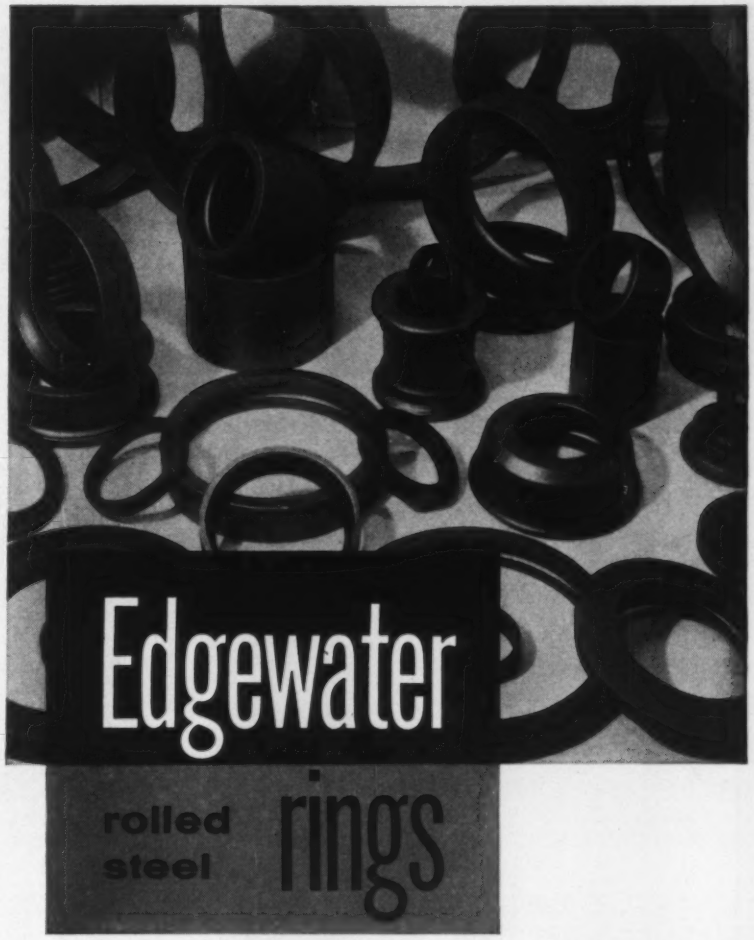
D. A. Sommer, appointed general sales manager, Keystone Steel & Wire Co., Peoria, Ill.

The Whitney Chain Co.—**D. R. Whitney,** appointed quality control manager.

General Electric Co. — **T. L. Mayes, Jr.,** promoted to manager, original equipment manufacturers sales, General Purpose Control Dept., Bloomington, Ill.

Thiokol Chemical Corp.—**H. D. Germann,** appointed manager, government operations for Thiokol's West Coast district office.

Alloys Unlimited, Inc.—**Leonard Bernstein,** named director, research and development.



diameters 5 to 145 inches—accurate rolling reduces machining—simple or complex cross-sections—rolling gives strength, toughness

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BRAND NEW PROCESS is easier to operate and control, provides better uniformity of color and greater production efficiency than ever before!

here's why:

NO HARMFUL BREAKDOWN PRODUCTS. There are no harmful materials formed from the N2E addition agents as a result of the plating process! Thus, batch treatment is necessary only when contaminants from other sources enter the bath and continuous carbon filtration will not remove them. The result is a substantial saving in solution, downtime, manhours and additional chemicals ordinarily required to treat and rebuild the plating bath.

CONSISTENT UNIFORMITY. N2E addition agents are noncritical in concentration. Reasonable variations from recommended concentrations will not seriously affect the characteristics of the deposit. Overall uniformity of color is maintained. Even in deep recesses on the backs of intricate die castings, amazingly clean deposits are obtained.

WIDE CURRENT DENSITY RANGE. N2E's average current density range is 30 to 60 amperes per square foot, with a considerably higher limiting current density. This wide range permits faster plating at a higher average current density without burning.

GREATER TOLERANCE TO METALLIC IMPURITIES. The absence of harmful breakdown products is of special importance in connection with metallic contaminants, since the undesirable effects of the two are cumulative. Another N2E 'plus' factor that helps maintain uniformity and quality.

ADHESION GREATLY IMPROVED. Production experience over a considerable period of time has conclusively demonstrated the excellent adhesion characteristics of Udylite N2E in combination with the Incomparable '66' Bright Nickel Process.

ECONOMICAL CONTINUOUS FILTRATION. One of the outstanding advantages of N2E is the fact that the bath can be continuously filtered through an activated carbon pack without appreciable loss of brighteners. The cleaning action of the continuous carbon filtration permits long periods of uniform, high quality production. The stability of N2E addition agents also permits economical bath purification by low current density electrolysis.

CAN BE ADDED DIRECTLY TO BATH. N2E addition agents are liquid and can be added directly to the bath without the use of filters. For high-speed operation, air agitation of the bath is recommended, although N2E performs well with mechanical agitation and can even be used without agitation.

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world's largest plating supplier

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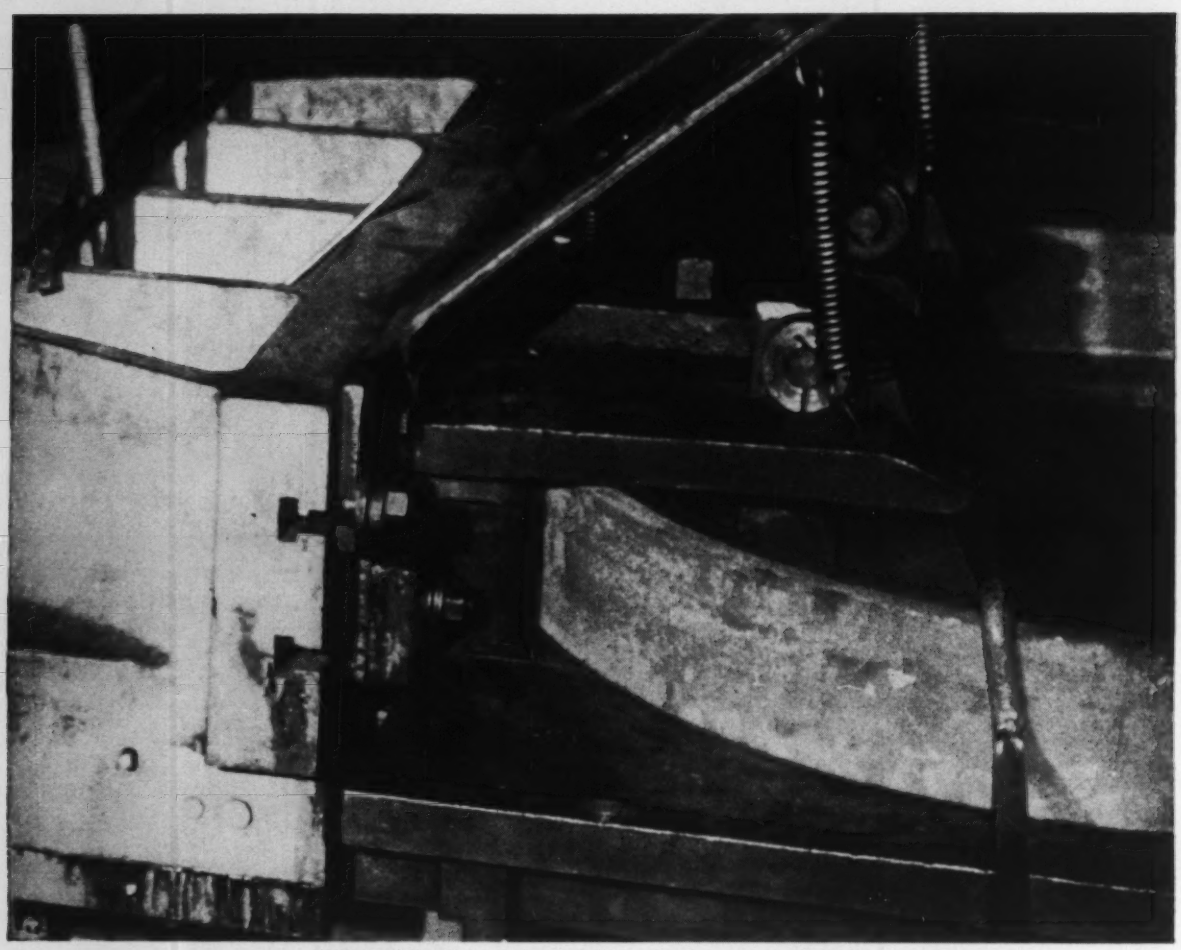


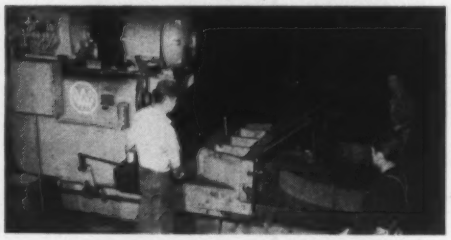
Williams-White 250-ton Hydraulic Bulldozer forming circle ring for Austin-Western power grader.

Austin-Western throws a perfect curve with a 250-ton W-W "arm"

Job: Form a perfect circle from a 184" long hot rolled angle stock, 6" x 8" x 1¼".

A ring forming die in a 250-ton Williams-White Hydraulic Bulldozer puts the curve into this heavy workpiece as it comes cherry red from a nearby furnace. A simple hand control provides precision ram movement. Austin-Western Division of Baldwin-Lima-Hamilton Corporation is using the Williams-White Hydraulic Bulldozer to make 62" O. D. circle rings for its famous line of power graders.

Williams-White strength and design team up with Austin-Western tooling skill to get a big job done fast and easily. For details on Williams-White Hydraulic Bulldozers 50 to 500 tons, *write for free Bulletin 73.*



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Lubricates With Air

New air-lubricated bearings hold promise for a wide range of future military and space jobs. The bearing surfaces never touch during rotation. One bearing generates its own film when rotated at high speeds. The other is a special, porous, powder-metallurgy product through which pressurized air is forced to form a lubricating film. Use: in those jobs where speed, temperature or radioactivity restricts standard lubricants.

Magnetic Sandals

The first space voyagers may wear magnetic sandals to help them walk in the weightless free-floating conditions caused by flight outside the Earth's gravitational field. In experiments, each of four airmen was fitted with sandals made by bolting permanent magnets through rubber shims to aluminum soles. Thus, they were able to move about in an almost normal manner upside down.

Shrinks Circuit Size

Expected to find wide use in space-age electronics are new tantalum capacitors just developed by RCA. The new capacitors are so tiny that 24 can be mounted on a printed-circuit board in an area the size of a postage stamp.

Nike-Zeus Awaits Signal

Army men are predicting the Nike-Zeus missile killer will take a bigger part in short- and long-range U. S. defense plans. The anti-missile missile looks as if it will get the go-ahead sign for more budget money shortly. Long range plans, say Army sources, are to protect every major U. S. city with the Nike-Zeus.

Deforms by Electricity

A study contract for the use of electrical discharge to form high-strength metals has been received by Republic Aviation Corp. Two basic methods will be compared for shaping stainless steel and aluminum. The first involves deformation of a metal workpiece by shock waves created in a liquid medium. The second uses an induction coil placed near the workpiece to develop opposing currents in the coil and metal. Result: a magnetic force which repels and deforms the metal away from the coil.

Rubber Protects ICBM

Resisting temperatures twice as hot as the heat it takes to melt steel is a new rubber compound. It gave a major assist to the Minuteman ICBM, successful in its first flight. The rubber serves to insulate rocket and missile-motor casings from temperatures as high as 5000°F.

Insulates Motor Wiring

Key to the performance of a new motor that can operate in—60°-500°F temperatures is wiring encapsulated in ceramic. Under development for three years, the new design makes use of a special aluminum-anodizing method for wire insulation. The stainless-steel motor plays a key role in the new electrical throttle system for the B-70 bomber.

Bimbo Makes Its Bid

It's expected that the 20-ton solid fuel engine, Bimbo, will be used as single stages of advanced deep space research vehicles. Capable of generating 400,000-lb thrust, Bimbo is the predecessor of even larger engines using grain propellants, much like the chopped-up lengths of Cordite in World War II artillery shells.

Launches 12-Ft Sphere

The successful launching of the 12-ft balloon-type sphere by a Scout rocket marked two "firsts" in space history: It's the first U. S. satellite orbited by an all solid-propellant rocket; It's the first satellite to be launched from Wallops Island, Va. The 15-lb Echo-type balloon is made of Mylar plastic and aluminum foil.

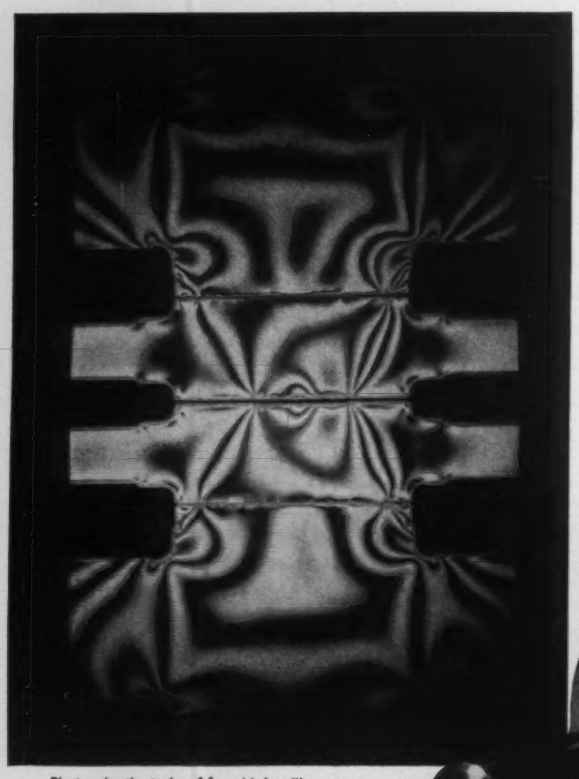

Photo-elastic study of four-high mill showing pressure patterns on roll surfaces.

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MADE TO STAND MAXIMUM STRESSES AT ALL POINTS

. . . and produce fine *Micro Lustre*® finishes

Extensive photo-elastic studies of roll pressures by Midvac engineers reveal a build-up of pressure patterns in certain areas. For long life, rolls must be able to stand these extreme pressures at all points.

That is why Midvac Rolls outlast others. They are specially made to stand maximum pressures wherever they build-up. The Midvac process of consumable electrode melting eliminates atmospheric and refractory contamination, therefore inclusions are held to a minimum assuring the strongest rolls possible. Of the hundreds of Midvac Rolls now in service not one has ever broken and their deep Micro-Lustre grain structure has permitted operators to repolish them in ½ the time of other rolls.

Midvac Rolls are precision ground to a deep, black, Micro-Lustre finish . . . assuring rolling of stainless steel, foil and precious metals free of surface imperfections.

Improve product quality and get more footage out of every roll—specify Midvac Rolls on your mills. Midvale-Heppenstall also makes forged rolls for rolling steel and nonferrous metals, paper, plastics and rubber.

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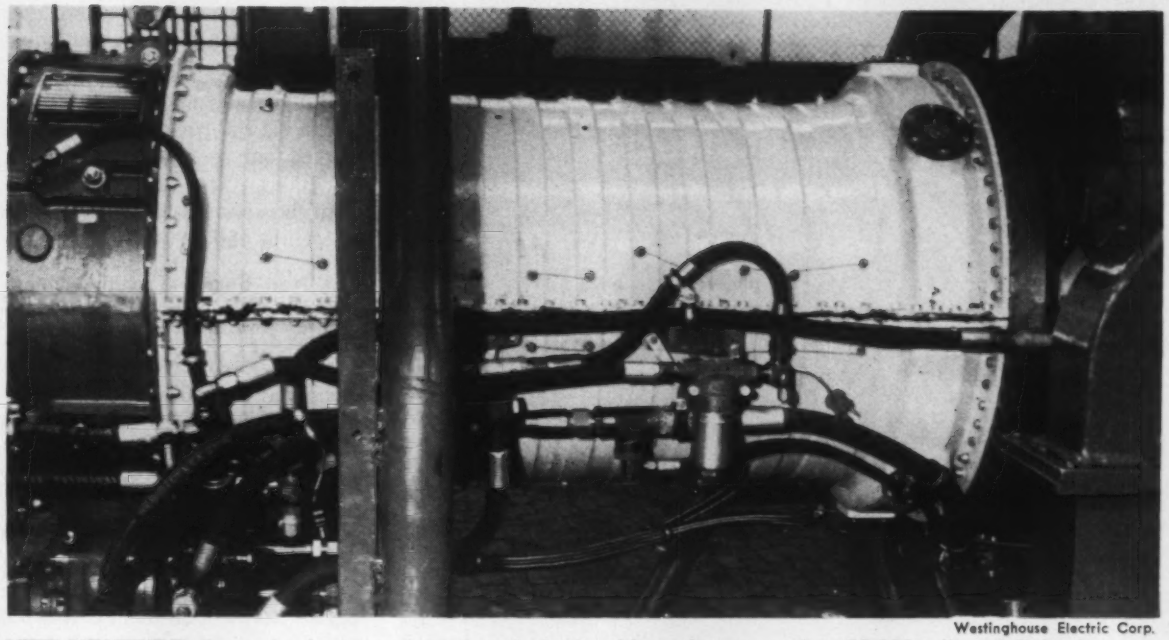


Westinghouse Electric Corp.

NEW VENTURE: Jet engine housing of reinforced plastic withstands test equal to 75,000 miles of flight time.

Industrial Horizon Widens For the Newer Plastics

During 1960, 6 billion lb of plastics were produced in this country alone. Look for this figure to double by 1970.

New trends are developing. Here are a few worth watching.

■ Ask a plastics engineer whether he thinks plastics are out to replace metals. His quick reply will be, "Plastics will serve to complement metals." In the metalworking field, that seems to be the general tenor of things to come.

Metals have certain properties that plastics will never possess. On the other hand, there are many plastic materials equipped to give metals added performance. Improved traits in such areas as lighter weight, corrosion resistance and dielectric strength can be included in the partnership.

The average person might be surprised to learn how effective plastics have actually become. Consider the steady orbit of Echo I, for example. This satellite is virtually a plastic balloon. Solid-propellent fuels are also plastic materials.

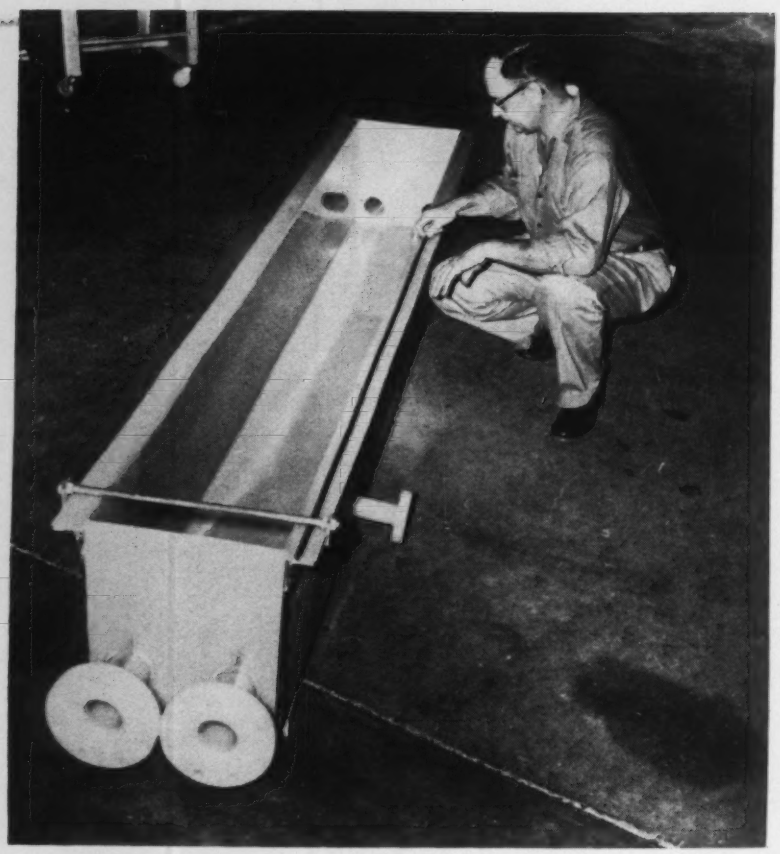
Sobering Effect—Whenever men of plastics get together, enthusiasm and optimism seem to prevail. Lately, however, this happy outlook is going through a tempering stage. The new emphasis is on quality control.

The stiff competition among various types of plastics poses certain problems. The price tends to drop. The selection broadens. Yet, these conditions are futile unless quality is maintained. That's why the emphasis is on quality control and proper use of materials.

One is bewildered by the many kinds of plastics. The maker of the resins and molding powders knows the capability of its materials. Take the manufacturer's advice. Don't put the round peg in the square hole.

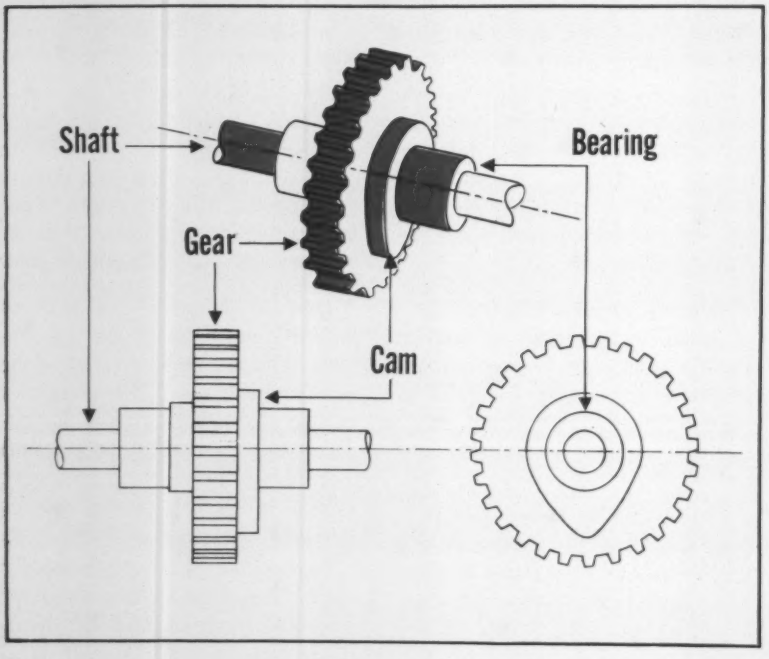
Deep in Research—As in every industry, much about the applications of tomorrow is revealed by the research of today. The impact of plastics in metalworking is expected to grow in the years to come. The initial impact was in decorative fields. The pattern is now moving into functional areas as well.

In the past, plastics have enjoyed use in aircraft on leading edges and wing tips. Now a compressor hous-



SUPERIOR LINING: The protection needed to combat the effects of chemicals can be found in Hercules Powder's polypropylene (Pro-fax).

How Delrin Combines Functions



ing has been developed for aviation gas turbines. The plastic housing came through with flying colors after being subjected to a test trial equal to 75,000 miles of flight time.

It's probably the first time that such a big and complex product has worked out so well under critical conditions. The housing, molded from glass-reinforced polyester, held up well at 450°F.

A New Foam—The lowest density particles ever made can now be produced in foams. The particles can be colored. They can also be metallized. As far as the metals industry is concerned, this invention could lead to vast improvements in lightweight, thermal insulation. It could be made into a dry lubricant or into molecular sieves.

Polypropylene, shaped into a hinge, underwent one million repeated flexes. Odd thing is that the hinge kept getting stronger. Automakers have already expressed interest in the material for accelerator pedals. Air deflection registers in car air conditioners are another possibility.

Reinforced Plastics—Researchers are moving ahead with reinforced plastics for the Space Age, too. Much work is underway in rocket casings and many missile parts. Builders of commercial aircraft are also attracted to this high-strength, anti-corrosive material.

Screws and rivets are the fastening devices used in a new chain frame mounting ring. This structure of reinforced plastic owes its strength to filament winding. One such structure was built to the same dimensions as the ring on the Discoverer nose section.

Electrical Avenues — Resins are to the plastics industry what ores are to the metals industry. New "furfuryl alcohol" resins have been developed which will adhere to metals and have good electrical traits. Up until now, this had been a closed door for this particular resin.

Successful research into polyethylene is expected to widen the market

for its use. Already well established as a coating in the wire and cable industry, polyethylene now has the added properties it will need to compete more favorably in piping jobs.

Another advance for plastics in the field of wire insulation involves Teflon. A filler has been added to this well known plastic which will increase its resistance to abrasion anywhere from 10-150 pct.

Still another new plastic has been exposed to 500°F temperatures for 700 hours before losing any of its strength, thus making it a likely candidate for missile jobs.

Advance Notice — Engineers at du Pont report that they have devised a method whereby they can predict the end traits of polyethylene prior to synthesis.

The Naval Ordnance has been testing hafnium as a filler in a specially-made plastic. This material has been molded into an insert for a rocket nozzle. When fired, it held up well. Other fillers under study include titanium and zirconium.

A research group at Boeing Airplane Co. has even looked into the ability of a Mylar gasket to stand up under cryogenic conditions.

Non-Plastic Help — What else is being done in the rocket field? To provide more reliable insulation for a solid-propellent motor, the Navy has been working with a phenolic filled with graphite and carbon. This structure is reinforced with aluminum silicate fibers.

Research is also digging into adhesive bonds for metal and sandwich panels in aircraft. One method is successful in the temperature range between −67° and 250°F.

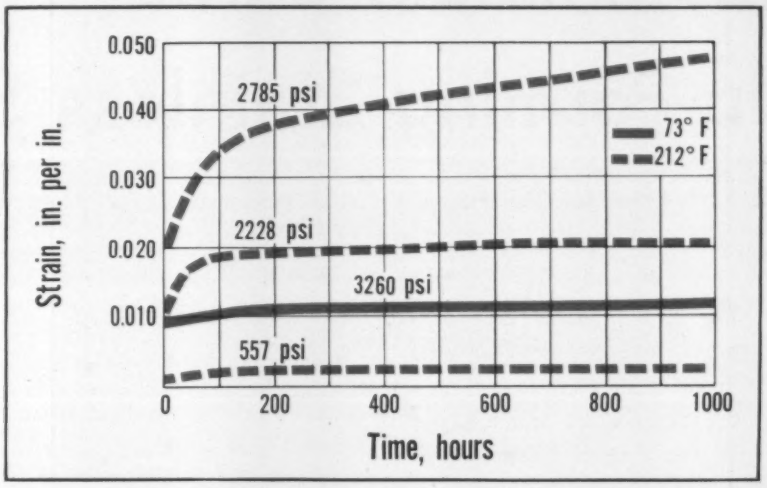
Road Ahead—It might be only a matter of time before you see plastics at work in some unusual jobs. Encouraging results have already been noted in such functional applications as oilfield pipe and anchor chain.

Manually-controlled devices for drilling are starting to break through equipped with plastic handles. This is mainly a safety precaution. Plastics have even improved the firing accuracy of a .22 rifle. Here, the main section of the rifle is a one-piece plastic material.

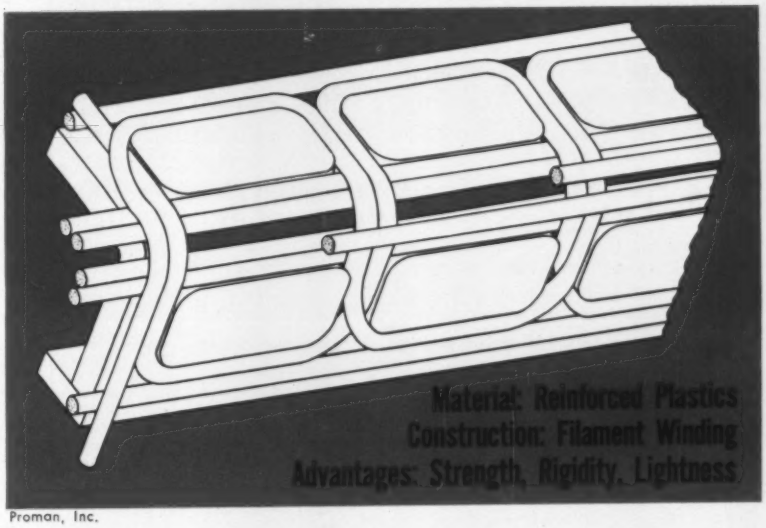
General Electric Co.'s Lexan, a polycarbonate resin, has a good deal to offer. Here's a thermoplastic material that can be cold formed by common metalworking tools. It is already being used in a critical bearing application.

Sales Boom—The huge popularity enjoyed by Delrin has been achieved in a very short time. Wider use of this material by the metalworking industry is expected in the not-too-distant future.

Lexan Can Be Cold Formed



Structure Maintains Strength



Proman, Inc.

Five years ago plastics became a $1 billion a year industry. In 1960 its dollar sales are very close to the $2 billion mark. The U. S. Dept. of Commerce looks for increased sales this year with more plastics going into construction, transportation and refrigeration applications.

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Columbium Curbs Wrinkling In Forming Stainless Strip

By **C. T. Evans, Jr.**—Vice Pres. & Technical Director, Universal-Cyclops Steel Corp., Bridgeville, Pa.

The auto industry uses AISI Type 430 stainless steel for most trim applications.

But automakers aren't happy with the rippled finishes when this alloy is stretch formed.

A pinch of columbium assures wrinkle-free finishes.

■ Use of stainless steel trim is widespread throughout the auto industry. Stainless steel also dresses up other functional parts, such as kitchen utensils, while resisting corrosion.

In 1930, Ford added stainless steel exterior trim to the Model A. Both hub caps and radiator cowls were formed from stainless. These parts are still bright and shiny on the existing cars of that era.

Corner the Market—Two principal grades of stainless steel serve as auto trim. These are AISI Types 301 and 430.

The straight-chrome Type 430 costs about 20 pct less than the chrome-nickel Type 301. For this reason, it's used wherever its somewhat lower formability and corrosion-resistant properties permit.

However, 430 has one inherent drawback. This fly in the ointment tends to narrow its cost appeal.

If 430 is formed beyond its yield strength in tension, parallel "ridges" or "ropes" crop up on the surface. These are unsightly and can't be tolerated if fine finish is a must. In severe stretch bends, they can be felt with a finger nail.

Smooth all Ripples—Some automakers call this condition the "washboard" effect. But no matter what it's called, these ridges must be removed. Naturally, this boosts overall costs.

Ridging in 430 stainless isn't confined to the auto industry. It also creates problems in the deep drawing of kitchen utensils and other parts. Ridging becomes a problem whenever the metal is stretched well past its elastic limit, near its breaking point.

Ordinary buffing, tumbling or electropolishing will not remove the ridges. Mechanical polishing is the only way around this bottleneck.

Many Culprits—All ridges run parallel to the direction of strip rolling. Grain size, residual strains and grain orientation all affect the degree of roping.

Many investigators have studied the roping phenomenon. They've suggested both mechanical and thermal means of precluding this condition. None of these schemes produce a consistent minimum-roping product.

Recently, the Universal-Cyclops Steel Corp., Bridgeville, Pa., discovered that the addition of a small amount of columbium to 430 stainless reduces or eliminates roping in even the most severe forming operations.

New Patent—Columbium proves effective in the range of about 0.02-1.0 pct. Optimum addition of this element appears to be 0.25-0.6 pct. U. S. Patent No. 2,965,479, issued to Universal-Cyclops, covers this development. The improved

How Alloy Compositions Vary

Element	Typical Analyses, pct		
	AISI Type 301	AISI Type 430	Uniloy 430MR
C	0.15	0.12	0.078
Mn	2.0	1.0	0.5
P	0.045	0.04	0.018
S	0.03	0.03	0.007
Si	1.0	1.0	0.46
Cr	18.0	14.0	16.63
Ni	8.0	—	—
Cb (+ Ta)	—	—	0.45

alloy is called Uniloy 430MR stainless.

Illustrations depict columbium's effect on 430. One picture shows how columbium controls the roping in a tensile sample. In this two-part picture, the upper figure shows regular 430 stainless. The smooth sample shows Uniloy 430MR.

Both samples were pulled in tension beyond the yield strength. Load was applied until the samples started to neck down, just prior to failure.

Remains Smooth—Heavy ridges on the 430 sample contrast with the almost completely rope-free 430MR test bar.

The second illustration compares segments of stretch-formed 430 and 430MR. These samples appear in the same relative position, after being formed into auto-trim parts. The Uniloy 430MR sample will require little or no follow-up finishing.

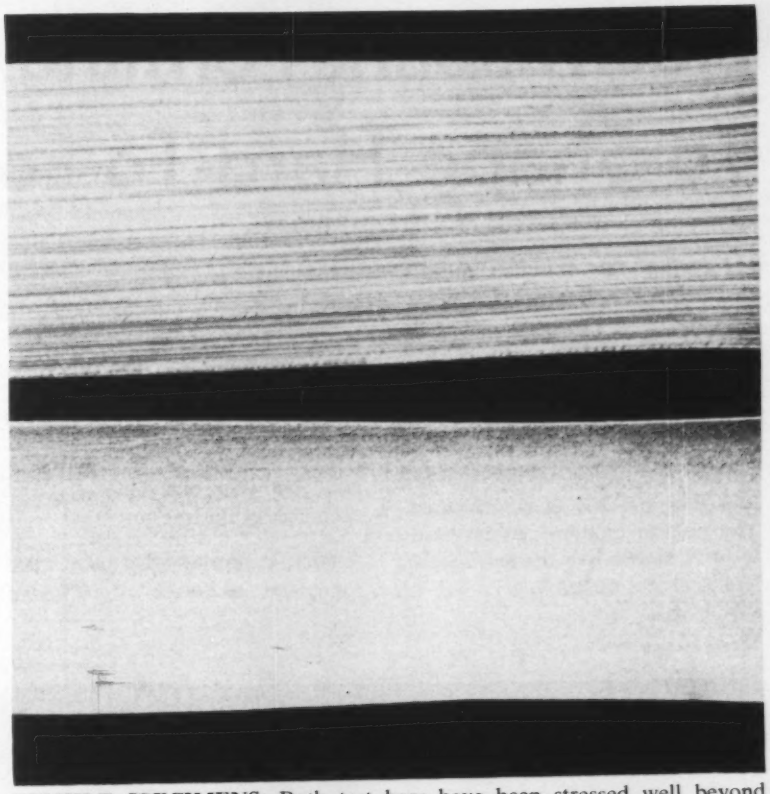
Adding columbium doesn't adversely affect the physical and corrosion-resistant properties of stainless strip. Results include slightly higher ductility-to-strength ratios. This indicates improved formability. Thus, along with better appearance, Uniloy 430MR offers easier fabrication.

Welding Benefit — Tests also prove that adding columbium increases corrosion resistance whenever welding operations are performed.

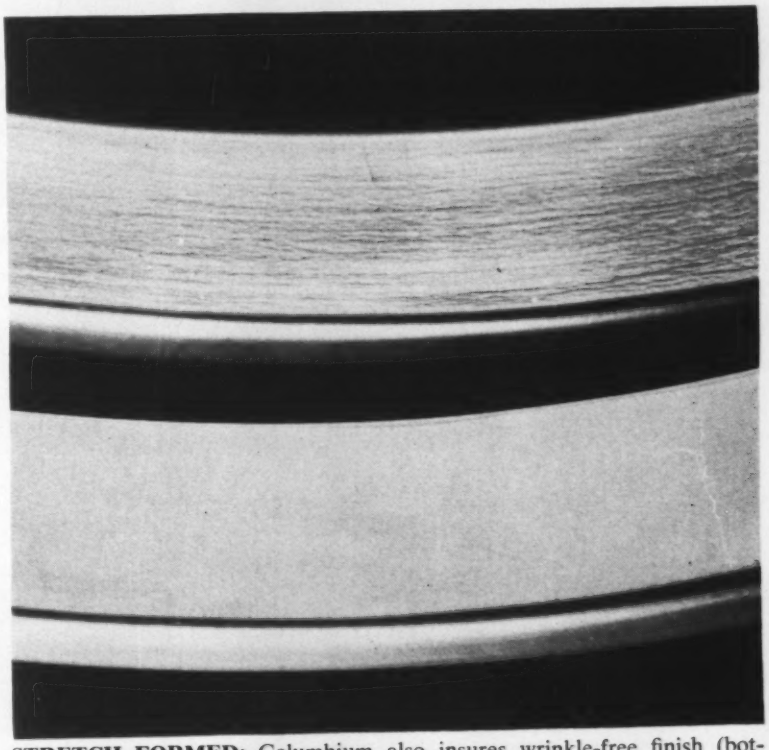
General workability of Uniloy 430MR is about the same as regular 430, both in hot and cold rolling. Uniloy 430MR yields just as high a degree of finish as 430 stainless.

Since its development, quite a bit of the new strip have been shipped to consumers. Actual use proves out the consistent and dependable effects of the columbium addition.

Introduction of the new stainless alloy, the first new analysis in a long time for auto trim, promises big savings for many consumer industries. Uniloy 430MR will play a leading role in extending the market for stainless steel trim.



TENSILE SPECIMENS: Both test bars have been stressed well beyond their elastic limits. Columbium in the lower sample prevents wrinkles.



STRETCH FORMED: Columbium also insures wrinkle-free finish (bottom) on auto-trim parts. These parts are stretch formed to desired shape.

Electrospark Forming: New Way To Shape Hard-To-Form Metals

Forming the tougher metals often presents problems.

Electrical blasts can create shock waves to shape these metals—even 1-in. thick sections.

▪ Electrical explosions are the key to a new low-cost shaping method. The process is aimed at the hard-to-form metals like titanium, stainless steel and tungsten.

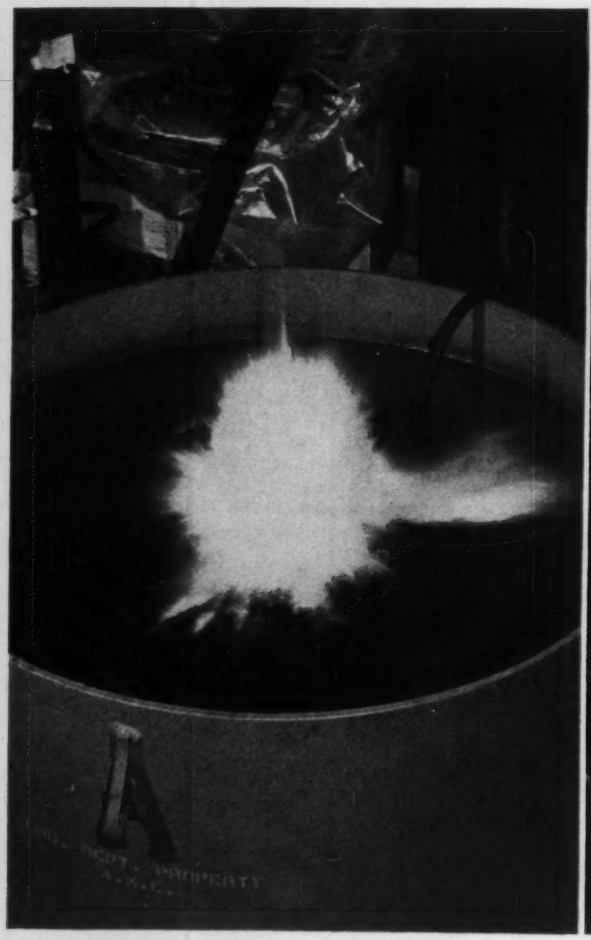
General Electric Co., Schenectady, believes the process may make possible a saving of millions of dollars a year now spent in costly working of these difficult metals.

The process is described as "capacitor discharge electrospark forming." No TNT, dynamite, or other chemical explosives are used.

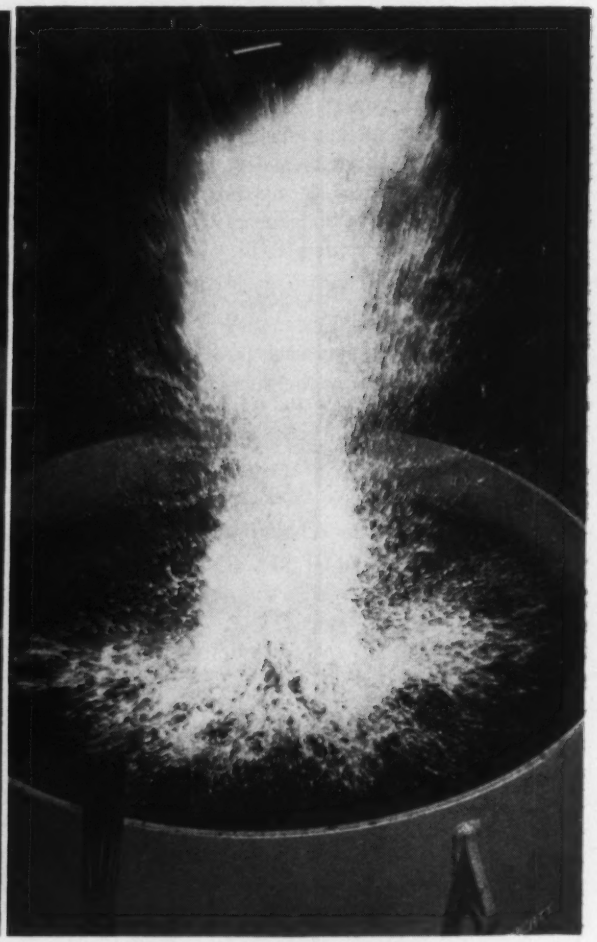
How it Forms—The controlled explosions create shock waves of immense force. The force in turn blows intricate contours into the metals in millionths of a second.

The explosions are induced entirely through a buildup of electrical energy. This energy is only available at about 35,000 v at present, but eventually 100,000 v or more will be used.

Made to occur under water, the electrical blasts create high-intensity shock waves which are directed



CONTROLLED ENERGY: The well-defined fountain of water is evidence of the focusing effect of the energy.



HIGH VOLTAGE: The mechanical force is discharged by means of a 30,000-v spark directly from a capacitor.

against the metal pieces to be formed. Upon impact of the shock wave, the metal instantly takes the shape of the die into which it is blown.

The die is evacuated to remove air pockets that could cause the piece to have surface irregularities.

Key Advantages — Electro-spark forming eliminates storage and handling problems associated with chemical explosives. Facilities where the work is performed need not be located remotely from other manufacturing operations.

The new process is expected to play an important role in the manufacture of aircraft and missile parts. Here, a large percentage of the parts are made from metals difficult to form by other methods.

Some of the metals that fall into the hard-to-form category include titanium, columbium, tungsten, molybdenum, certain steels and beryllium alloys.

Successful Step—GE thus far has shaped titanium, columbium, beryllium-copper and the more difficult grades of stainless steel. The other metals have not, as yet, been tested.

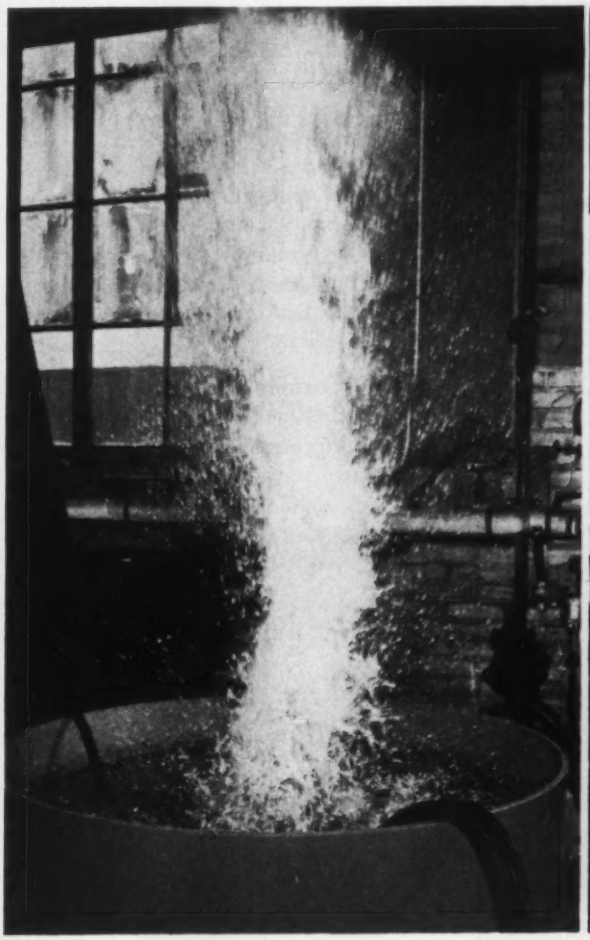
Forming is done at room temperatures and no preheating of the metals is needed to make them ductile. The pieces take on the shape and surface texture of the die into which they are exploded. The shapes then require only minimum finish machining after they are removed.

The laboratory formed pieces up to 10 in. in diameter and 3/32-in. thick by the new process. However, the forming of much larger pieces is considered entirely feasible.

Some present planning looks to electro-spark forming of missile sections 10 feet or more in diameter and at least an inch in thickness, although this would not be done by the laboratory.

General Electric is seriously studying the potential market for the electrospark forming process. Naturally, the company's prime interest would be to supply the electrical components used in the process such as capacitors, switchgear and transformers.

Several companies have already shown much interest in the new process and are awaiting results of the heavy gage metal applications.



FULL FORCE: The workpiece is formed in millionths of a second. Here, the full amount of energy is absorbed.

TOUGH JOBS: Electrospark forming handles the hard-to-form metals such as titanium and tungsten.

Developments Spur Interest In Investment Casting

The investment casting process is on the move again.

Latest developments include a method for casting, under vacuum, with controlled grain sizes at preselected sites.

By **C. L. Kobrin,**
Metallurgical Editor

■ Key to the bright future for investment casting at Haynes Stellite Co. are these recently announced developments: Emphasis on vacuum-investment casting; a method for controlling grain size; new protective coatings.

How bright are the prospects? The Haynes Stellite Co. in 1961, according to H. E. Haley, manager-general sales department, should capture 15-20 pct of all the available investment-casting business in the country. In 1960, this Kokomo, Ind. division of Union Carbide Corp. took 10-12 pct.

Casts in Vacuum—Taking much of the credit for this rosy outlook is the vacuum-investment-casting technique. As the name implies, the technique differs from standard investment-casting practices in that both melting and casting are performed in a vacuum — 10 microns or under.

Though Haynes Stellite Co. still maintains extensive capacity for casting in air or argon, it feels there will be increased demand for vacuum castings. Thus, six new, 30-lb capacity, vacuum furnaces were recently acquired. Each is capable of 400 castings per day.

REFINE BEFORE CHARGING: Master heats of special alloys are first melted in a 1500-lb unit before used as charge for vacuum-investment casting. Some of output also goes into wrought-alloy production.

Guard Against Gas — Preserving the quality of the Haynes nickel-base-alloy charge is the main reason for casting in vacuum. (The charge metal comes from a 1500-lb vacuum - induction - melted master heat. Examples are Haynes 500 or 713C.) Otherwise, the aluminum and titanium present in these alloys may become contaminated by gases. Inclusions will result—a situation to be avoided when making aircraft-quality castings.

Other advantages of casting in vacuum are cited. Because the mold is also degassed, there's no back pressure when pouring, according to R. P. Culbertson, assistant technical director.

Thus, very thin sections can be cast. Moreover, the furnace operators find they get better control of temperature.

Controls Grain Size—The most interesting of the new developments is the technique for controlling grain size. Haynes claims it can cast parts of uniform grain size—and of a specified grain size.

L. E. Frey, manager, investment-casting development unit, makes this point. For years, investment casters have been criticized for the grain pattern. Unwanted "elephant grains" or large columnar grains were too evident.

The new method for controlling grain sizes solves this problem. The before-and-after photograph of two macro-etched parts shows what it can do.

Get a Choice of Two—The new technique for controlling grain size

goes a step further. Those who want it can get a casting with one grain size in one area and a second grain size in another area.

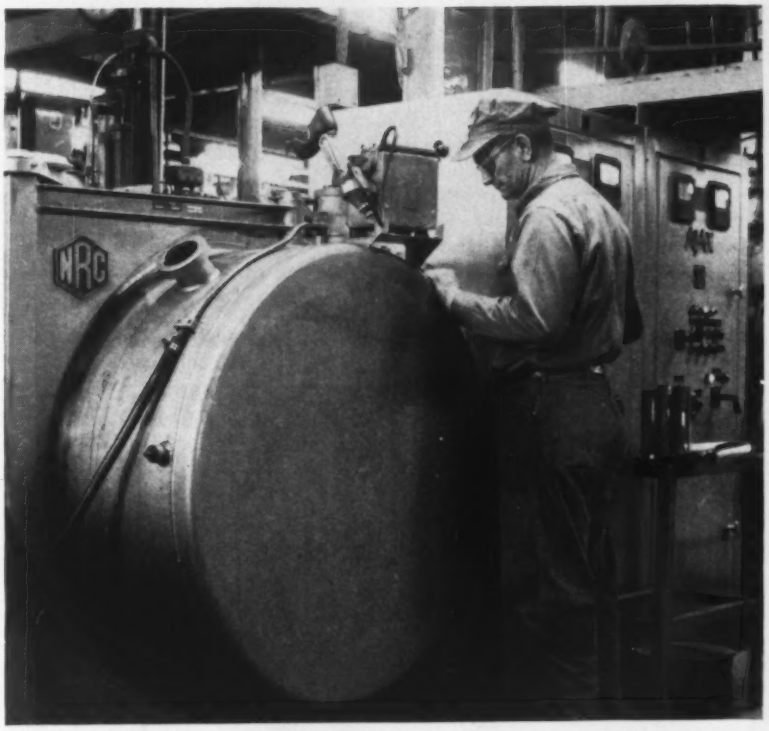
The photograph of a jet-engine vane shows a "dual-grain-size" casting. The coarser grains, about 1/16-in. diam, in the vane body are to provide good stress-rupture properties. The finer grains, about 1/64-in. diam, on the trailing edge are claimed to give good fatigue and thermal-shock properties.

How is it done? Haynes Stellite spokesmen won't say. There's still a question of patenting. However, it's apparently a combination of sound and properly-controlled molding, pouring, gating, and risering practices.

Coatings Enter Picture—As the latest step in integrating its operation, the Kokomo plant has developed its own protective, diffusion coatings. In addition to doing Haynes work, the coatings are being used on outside job-lot work.

There are two coatings involved. One, called C-3, is an aluminum-nickel composition. It's used to coat nickel-base alloys. The other, called C-6, is an aluminum-iron composition. It's used to coat iron-base alloys.

Applied by a pack-type process, the diffusion coatings are usually 0.001-0.006-in. thick. It's claimed that they're intimately bonded to the base metal and resist spalling and chipping.



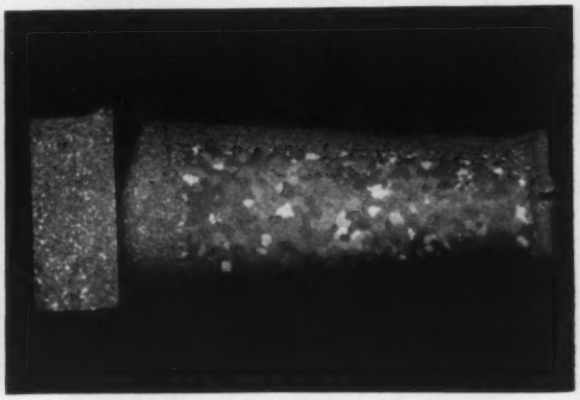
NOTES PROGRESS: Pouring cycle for making 30-lb vacuum-investment casting is about 30 minutes. Operator can view progress through view port.

Deters Fatigue—Tensile properties are not affected by these coatings. However, test data show that fatigue properties and resistance to thermal shock and flame erosion are improved.

The new coatings will not be limited to castings. It's believed, however, the principal market will be for aircraft-engine parts. Examples are blades, vanes, and heat shields.

Some industrial applications are also suggested. Internal-combustion exhaust valves are one. Heat-treat trays are another. Industrial waste burners and glassmaking equipment are other examples.

CONTROLS GRAINS: Method gives uniform grains (top) as compared to irregular grains (bottom).



TAKE YOUR CHOICE: Different sizes of equiaxed grains can be vacuum-investment-cast where desired.

Grinding Wheels Get Quick Mix

Data-Fed Mixer Boosts Wheel Quality

One millionth of a pound is very hard to measure. In fact, it's almost impossible.

However, one grinding-wheel maker is working to these tight tolerances. The secret? Automated mixing and measuring.

▪ The grinding wheel industry has put electronic processing units to work. How will this affect wheel users? For one, service will be much faster, especially when the customer needs a special type of abrasive.

Bay State Abrasives Co., Westboro, Mass., installed an automatic measuring and mixing system. The move put the company another step closer toward complete electronic control over quality and production.

This company is one of the first to adapt electronic calculations to grinding wheel formulas. This permits ingredients to be gaged to an accuracy of 0.000001 lb.

Creates Challenge — New metals and ceramics for high-temperature use create constant challenges for machine-tool and abrasive-product manufacturers.

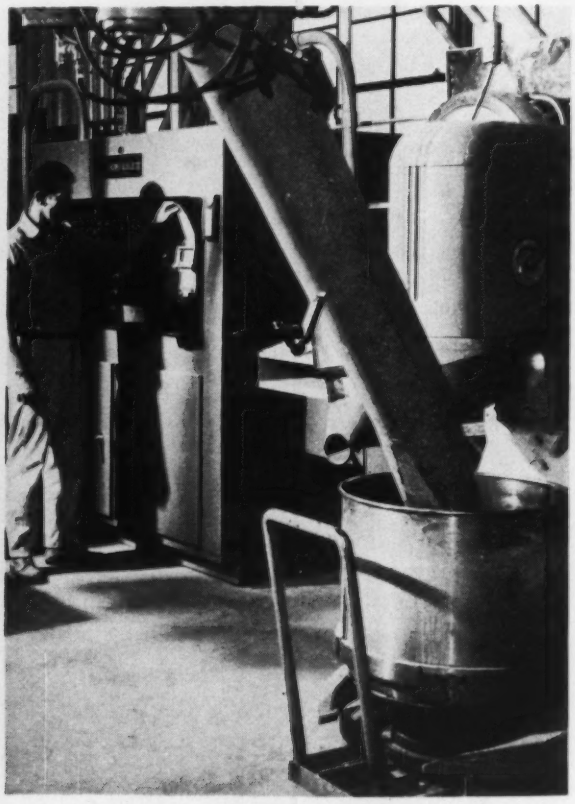
These challenges are being successfully met with new abrasive types, greater heat-resistant bonds, and higher machine and wheel speeds.

To find the exact formula for each wheel, five basic factors must be taken into consideration. These factors include abrasive type, size, wheel hardness, structure and the bond.

These elements in turn are affected by over 150 variables. A slight change in any one variable produces a totally new wheel, with different grinding qualities. Thousands of types are possible. These combinations are the abrasive specialist's tools when specifying a wheel.

First Step—To make a grinding wheel, first a formula is created. Since each wheel must be exactly

STARTING POINT: A. E. Gilman, president, Bay State Abrasive Products Co., programs the system.



CONTROL CENTER—Selects, weighs and conveys ingredients from storage area to mixing units.

right for a given grinding need, wheel needs are carefully checked in the customer's plant by a specialist.

This expert studies the speed and feed of the machine tool employed. He notes the material that will be cut and the type of surface desired on the finished work. As each of these, and other problems are solved, the formula begins to take shape.

When completed, the data is fed into an IBM computer. Here, it's permanently stored on punch cards. When a repeat order for a particular grinding wheel is received, an operator feeds the card into the computer which finds the correct volume of ingredients to fill the order.

A second card, punched with this data, activates a mixing machine. When the order card is inserted into the mixer, electronic impulses in the giant machine select and weigh the ingredients from huge storage bins.

Fast Feed — The precise volume of each ingredient is gravity fed through a system of pipes to a container in which the order is prepared. Then the mix, goes to heavy hydraulic presses where it's molded into required shapes.

After forming, the molds go to drying ovens for partial curing. Next, they enter special high-temperature kilns and are fired at temperatures up to 2300°F.

Since grinding wheel operations require high-precision work, each wheel undergoes a series of tests before it leaves the factory. These tests pinpoint: Shape, size, weight, balance and roundness. A reflectoscope, for instance, is used to detect hidden internal seams and flaws.

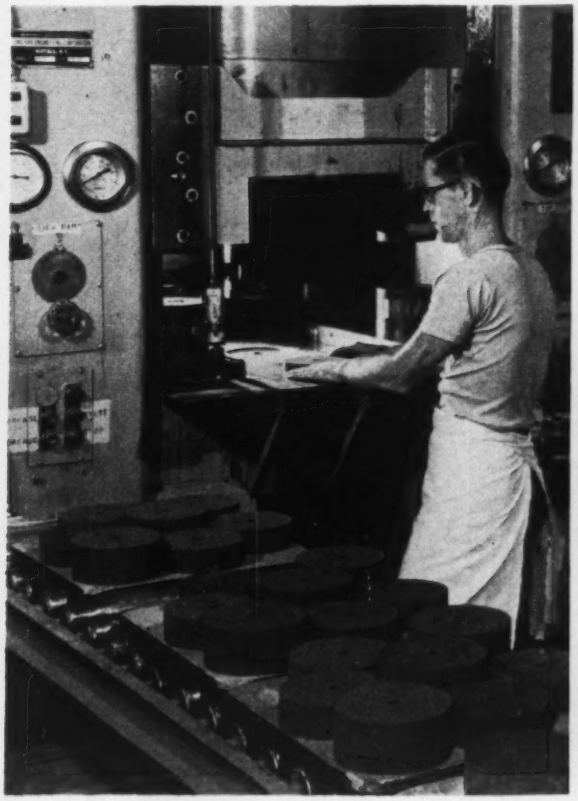
Record Flaws — This instrument sends high-frequency sound waves into the wheels. Flaws interrupt these waves. All interruptions (and flaws) are recorded.

Other checks determine "truth" and balance conditions. All wheels that are 6-in. diam and over are spin-tested at speeds in excess of those recommended for customer use. This test certifies the wheels for safety.

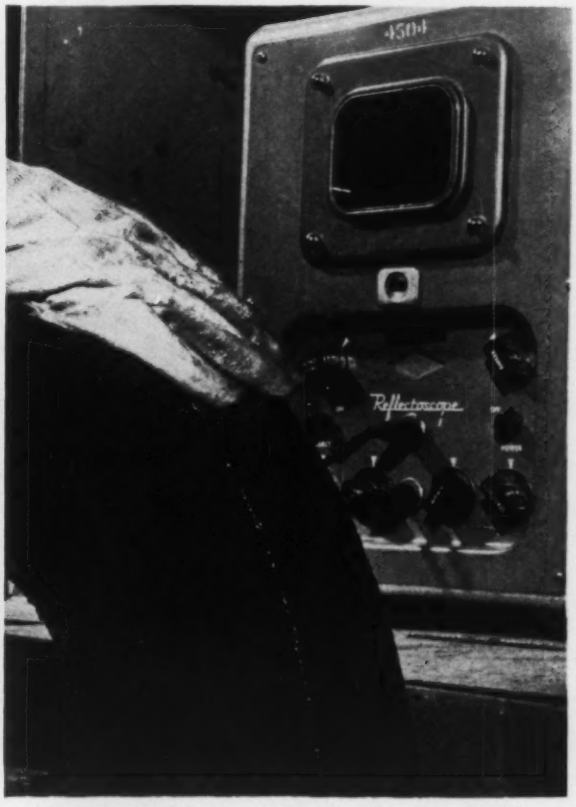
The final step in the manufacturing process centers on the use of a stencil or wheel blotter. Every wheel is coded. Coding serves an important function.

Wheel costs range from a few pennies for common wheels to thousands of dollars for a diamond-grit wheel.

Customers' wheel formulas are permanently stored on IBM cards. When an order comes in for a quantity of this type wheel, the card is fed into a computer which determines the volume of each ingredient needed.



BIG SQUEEZE: Press forms grinding wheels to exact sizes. Careful handling prevents edge damage.



CONTROLLED QUALITY: Multiple tests assure that every wheel is correct in shape, size, weight, balance.

Engineers Come to Grips With Weld Distortion

There are ways to avoid weld distortion, even in critical steam-turbine work.

Sound jobs can be produced, but only if engineering follows a systematic approach.

■ A big problem facing most fabricators is weld distortion. This unwelcome condition crops up in both production and maintenance work. There's no accepted cure-all for weld distortion, but closer attention to preheat and control welding can do a lot to reduce it.

Engineers at Allis - Chalmers Mfg. Co., Milwaukee, have won their share of battles with weld distortion, as pointed out by a project superintendent from the company at the recent 12th Plant Maintenance and Engineering Show in Chicago. These successes were stressed by W. A. Schumbacker in his paper, "Recent Experiences With Unusual Maintenance Welding Jobs."

Two of the jobs cited by the author dealt with critical work. The first one concerned production welding of diaphragms for steam turbines. Here, an electrically-heated hot plate was designed to maintain the proper preheat temperature for the weld cycle.

Spotless Record—To date, over two hundred of these diaphragms have been joined. In all this time, only one section has shown any evidence of cracking. After one year of round-the-clock service, the com-

HOT PLATE: The new hot plate keeps preheat at the desired level. Thus, it insures distortion-free welds.

pany-designed hot plate is still in perfect condition.

The second case in point involves the repair welding of a steam turbine spindle. This job would have been a failure had it not been for control welding, adequate preheat and a careful system of quality checks every step of the way.

In the first example, steam from the turbine passes through stainless vanes. These vanes are contained within stationary diaphragms. The vanes are welded to the periphery of the inner band of the diaphragm. Then the outer bands are welded to the periphery of the vanes. Webs and bands are made of either carbon or low-alloy steel.

No Cracks — Welds must, of course, be crack free. They are subjected to X-ray and magnetic-particle tests. After machining, each diaphragm also receives a severe deflection test which is about 100 pct more severe than the diaphragm will experience in service. To pass these tests, the weld deposit must bear close resemblance to its adjoining sections.

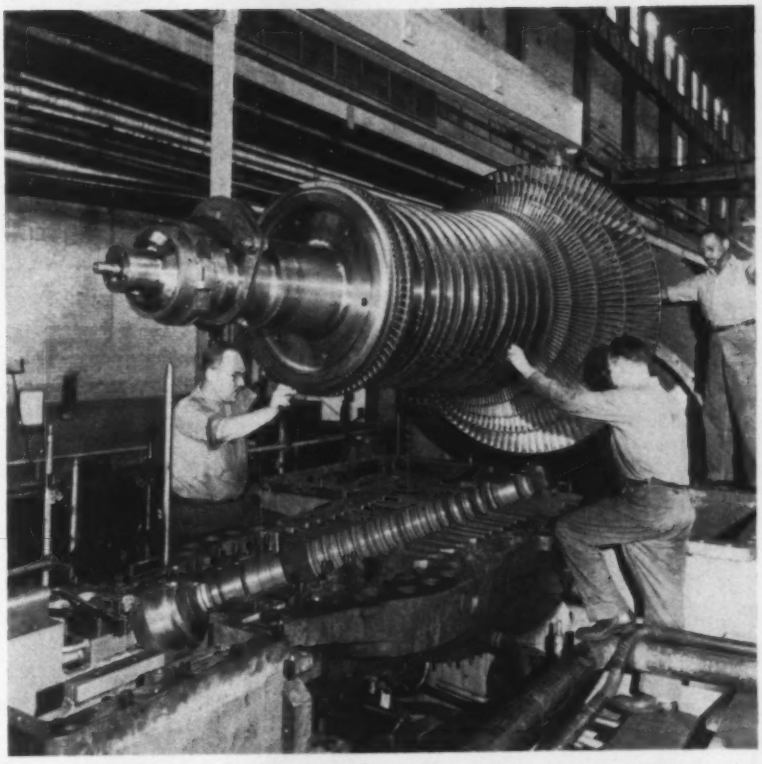
The purchaser chose manual welding for the job. Thorough studies revealed that a preheat of 600°F ±25°F would be required. This closely-controlled preheat had to be maintained during the weld cycle. Once welded, the section would be moved into a furnace for stress relief.

Allis-Chalmers couldn't put its finger on the exact type of preheat equipment needed. It solved the problem, however, by building its own 60-in. hot plate.

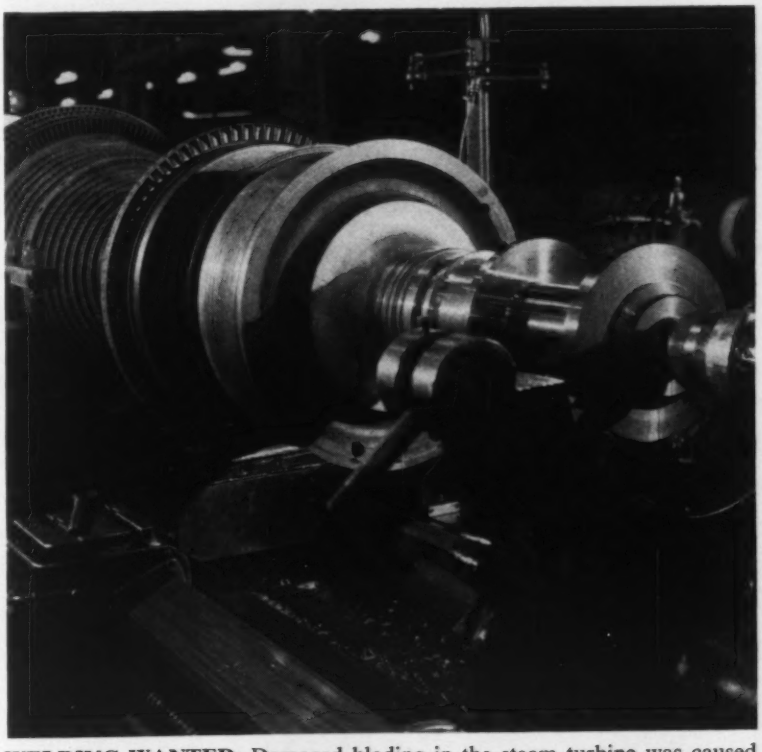
Weld Power—The hot plate uses a welding machine as a power source. This unit provides low voltage and high current.

The welding hot plate is semicircular in shape, with an overall thickness of 5½ in. Heating coils on the inside of the plate are wound in such a way to give uniform heating to the top surface. There's a socket underneath the plate so that it can be located on the table of the positioner.

The weldment is always covered



PRECISION PART: Critical component for Allis-Chalmers' WA series steam turbine is moved into position prior to final assembly.



WELDING WANTED: Damaged blading in the steam turbine was caused by the spindle's movement toward the exhaust end of the turbine casing.

by several layers of asbestos blankets. The welder merely exposes the small area he's working on at the time. This setup helps maintain a constant preheat at all times. It also means that the welder will be comfortable while he is on the job.

Ready to Go—Suppose this same hot plate were used in a smaller plant which operated on a one-shift-per-day basis. In such a case, the plate could run all night. The welders would be able to start work right away without any delay.

The hot plate is now used on all jobs at the plant where preheat is required during the welding cycle. The custom-made setup compares favorably with the formerly used gas hot plate. Weldments are of much higher quality. The electric plate also costs the company about 25 pct less to assemble and to install.

The electric unit does a much better job in holding the vital tolerances. A gas-fired hot table held tolerances (diametral and flatness) to ±0.045 in. during the welding of the diaphragms.

The electric hot plate took over the same job and kept tolerances down to ±0.015 in. The difference lies in the new setup's ability to maintain more constant preheat. The job was so successful that Allis-Chalmers has already built two more electric units.

The Other Job—A spindle on a steam turbine had to be repaired. The thrust bearing had failed, and that caused the spindle to move toward the exhaust end of the turbine casing. This, in turn, resulted in damage to the blading. The outer exhaust collar was also in need of repair.

Before any attempt was made to repair the spindle, the correct procedures were mapped out in advance. The ideal welding groove was determined. The best welding electrodes were also selected.

The maintenance group then obtained an 8-in. diam billet, 2 in. thick. The chemistry of the billet was similar to that of the spindle. Welding tests were performed on this sample.

Lathe Takes Over—After these weld tests were completed, the spindle was put in a lathe where runout was checked against the drawings for control welding. Meanwhile, a metal furnace was built over the thrust bearing. Propane torches were inserted at each end.

The engineers then placed water-cooled indicators in the preheat zone to record runout during welding and stress relieving. Three other indicators were placed at other spots on the spindle. The lathe was then set for a welding speed of 3-15 ipm.

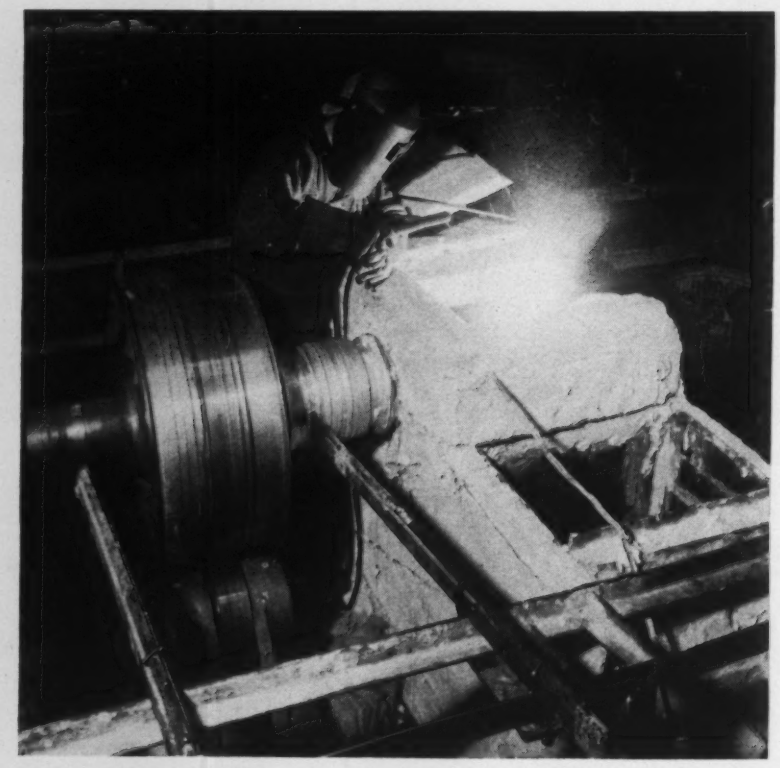
All finish-machined surfaces received coats to protect them from oxidation during preheat and stress relief. As soon as the thrust collar had been slipped onto the shaft, rotation began. Readings were taken and compared with those taken in the lathe.

Heat Checks — Three men on each shift ran the heat check lathe. Their duties included controlling the preheat temperature for welding, making readings and telling the welder the amount of runout.

During rotation, the temperature was increased by 100°F per hour until it reached 400°F. Rotation continued at this temperature for four hours. Then welding began. The tolerance was kept in line by rotating the spindle. Any time that runout reached 0.015 in., welding stopped and the spindle was rotated back to normal readings.

The weld metal was deposited by changing the beads from one side to the other. The first weld was on the inboard side of the thrust collar, penetrating through the 1/16-in. web on the spindle shaft. The alternating welding method, single-bead technique, completed the job.

Stress relief involved boosting the shaft temperature to 100°F per hour until 1150°F was reached. This temperature was maintained for three hours, then reduced at 100°F per hour right down to room temperature. And the steam turbine was ready for duty once more.



PROPANE HEAT: Propane torches, inserted at each end of the metal furnace, provide preheat and stress relief for the thrust bearing.

WORLD'S RECORD

IN BASIC OXYGEN STEELMAKING ESTABLISHED BY HARBISON-WALKER LINING

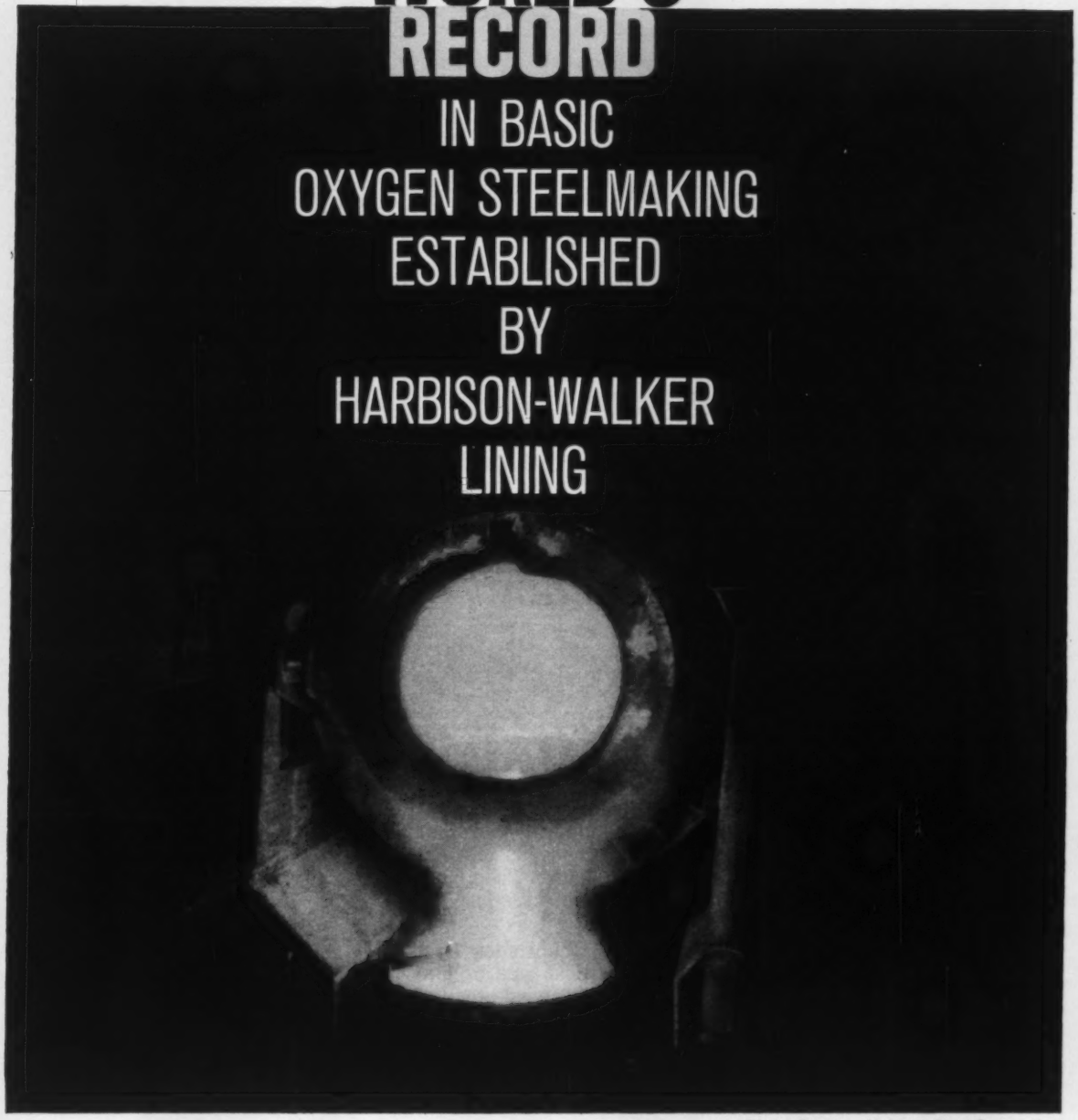


Photo: Courtesy McLouth Steel Corporation

A record number of tons of steel produced during a single furnace campaign has been achieved on a Harbison-Walker OXILINE H basic oxygen furnace lining. The campaign of 292 heats with negligible maintenance produced 31,405.05 net tons of steel.

Harbison-Walker produced the first tar-bonded basic brick in the United States . . . has been the leader in the field since the introduction of the basic oxygen process in this country . . . has developed and supplied linings for all furnaces in existence on the North American continent. In fact, more tons of steel have been produced on H-W OXILINE linings than on all other brands combined. HW 61-5

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Each Shepard Niles **JOB-MATED** Hoist is supplied with the combination of components best suited to meet your exact on-the-job conditions. This care in our plant means reduced handling, production, and storage costs in yours . . . through increased efficiency, minimum maintenance costs and extra years of service with QUALITY equipment.

You can choose **JOB-MATED** Hoists in capacities from ¼-ton to 30 tons . . . with motor-driven or push-type trolleys . . . single or multiple speed controls (multiple speed provides from 5 to 17 control steps) . . . pushbutton, pendant rope, or lever controllers . . . floor or cab-operation . . . vapor-proof or explosion-proof construction.

Each **JOB-MATED** Hoist is tested under full load before shipment, and is guaranteed to perform as rated without overheating of motors, controllers, and brakes. You'll find it will pay to look into Shepard Niles **JOB-MATED** QUALITY Hoists for your load-lifting and moving operations. Write for descriptive bulletin and request a representative to call.

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America's Most Complete Line of Cranes and Hoists

SHEPARD NILES
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1464 Schuyler Ave., Montour Falls, N.Y.

NEW PATENTS

Slag-Pouring Ladle

Design of ladle, J. L. and C. R. Beamesderfer (assigned to Lukens Steel Co., Coatesville, Pa.), Jan. 10, 1961. A new design prevents slag contamination in pouring cast-clad ingots. A plug in the pouring spout delays the flow of molten metal into the mold while the ladle is being tilted, thus floating the slag. U. S. 2,967,339.

Coats Strip Material

Coating apparatus and method, J. T. Mayhew (assigned to National Steel Corp., a corp. of Del.), Jan. 3, 1961. In galvanizing strip material, excess deposits on the strip edges are prevented by lowering the viscosity of the bath along the edges. This is done by heating the edges to a temperature higher than that of the bath.

High-Strength Alloy

New alloy for use at elevated temperatures, R. R. Brady and E. J. Dulis (assigned to U. S. Steel Corp., Pittsburgh), Jan. 17, 1961. An alloy having high creep-rupture strength at 1100°F and good rupture ductility consists of 0.18-0.22 pct C, 0.35-0.55 pct each of Mn and Si, 2.8-3.2 pct Cr, 0.5 pct maximum Ni, 0.9-0.11 pct Mo, 0.19-0.28 pct V, 0.45-0.55 pct each of Cb and Ti. The remainder is Fe. U. S. 2,968,549.

Cleans Hot Top

Method and apparatus for cleaning a hot top, R. C. Beason and B. F. Anthony (assigned to Oglebay Norton Co., Cleveland), Jan. 10, 1961. An apparatus for quickly removing spent veneer from the interior of a hot top. This yields a clean face for receiving a new veneer of refractory material. U. S. 2,967,790.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

Sharp-shouldered Bolt for a Precision Fit Made from KEYSTONE WIRE

Quality Fasteners, Inc., Kalamazoo, Michigan, serves many markets with its heading specialties. One such specialty is a D-shoulder bolt for a supermarket food cart caster, designed so it will key into the caster structure. This bolt is headed from annealed-in-process Keystone Heading Wire with Lime Brite finish. Quality Fasteners, Inc. heads this specialty without a relief attachment.

Chester Werme, veteran cold-header, President of Quality Fasteners, knows his wire. He buys Keystone Wire for all his forming operations, because, as he says, "We know what this wire will do and we design our products around it."

At Quality Fasteners, flowability of Keystone Wire is the secret which assures uniform quality, sharp shoulders and edges, correct tolerances with accurate dimensions. The result: Considerable savings and a better product over other machining techniques.

So, when you contemplate forming a product from wire, remember the superior flowability characteristics of Keystone Wire. Our Wire Specialists are always ready to consult with you about your wire forming problems. We invite you to call or write.

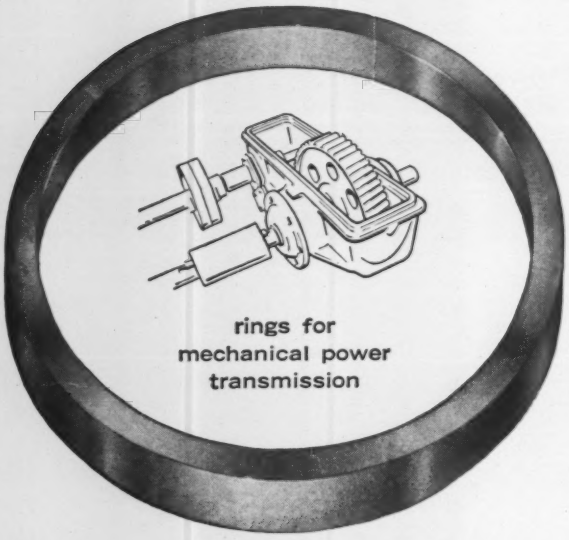
Keystone Steel & Wire Company, Peoria, Illinois

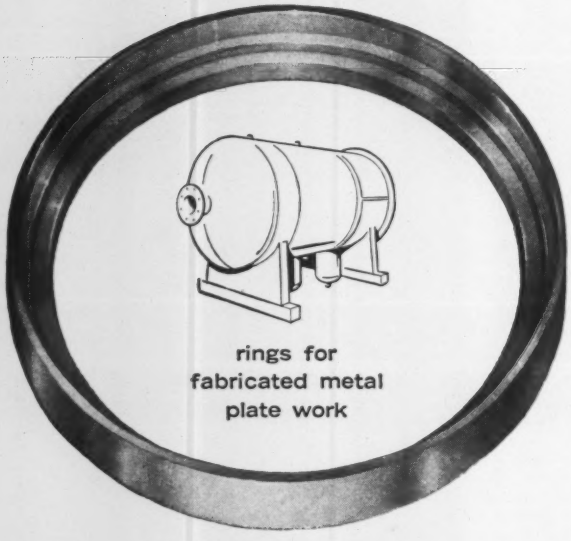
KEYSTONE COLD HEADING WIRE STUDY

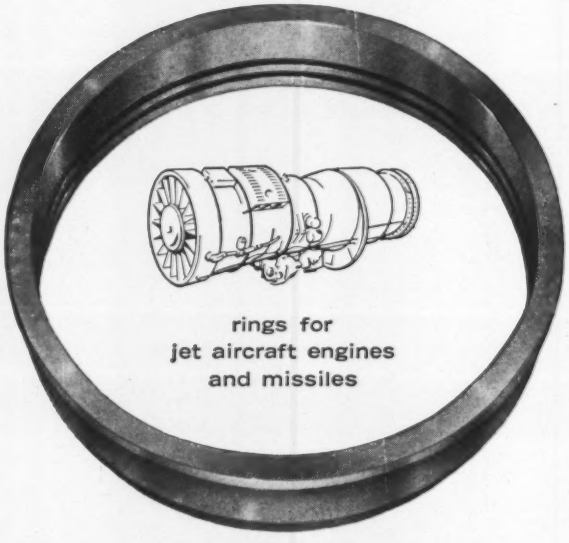
KEYSTONE

WIRE FOR INDUSTRY

MANUFACTURED AT PEORIA, ILLINOIS, U. S. A.







we make rings-you save money

Amweld flash butt-welded rings provide a welcome cost reduction opportunity for almost any manufacturer using rings of between four inches and eight feet in diameter from most of the common and exotic alloy metals. Amweld rings save on material because rings are formed closer to finished dimensions. Amweld rings save on machining, because the metal is left out—not hogged out.

Amweld customers saved over one million dollars last year. By close cost evaluation of circular components and assemblies, flash welded rings were introduced enabling substantial savings. It doesn't cost you to think on paper with Amweld. Let us quote you for your cost comparison. Write today: The American Welding & Manufacturing Company, 700 Dietz Road, Warren, Ohio.

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INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MANUFACTURING CO., WARREN, OHIO

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Chromate Analyzer

Automatic determination of chromates is described in a two-page methodology sheet. The complete chemical methodology is detailed for the rapid determination of chromates down to parts per million using an automatic analyzer. A flow diagram of the analytical system is included, together with the actual chart recordings derived. (Technical Controls Inc.)

For free copy circle No. 1 on postcard

Special Steels

Three data sheets, describe characteristics and typical applications of five special steels. The alloys are nickel-chromium-tungsten type and straight chromium tungsten type. (Heppenstall Co.)

For free copy circle No. 2 on postcard

Barrel Finishing

A brief folder summarizes the complete line of barrel finishing units and replacement barrels. Seven basic units are illustrated and described. (The Baird Machine Co.)

For free copy circle No. 3 on postcard

Regulates Voltage

A new single page data sheet describes regulated voltage power supply. The units used provide constant measuring-circuit current in potentiometer recorders and controllers. (Leeds & Northrup Co.)

For free copy circle No. 4 on postcard

Plating Circuits

A complete process for preparing and copper-plating printed circuit boards which require through-hole plating is fully described in a four-page Bulletin. (MacDermid Inc.)

For free copy circle No. 5 on postcard

Grinding Lesson

A 32-page booklet entitled Tool Room Grinding contains grinding and sharpening information for tool makers and tool room foreman. Explanatory data regarding grinding wheels includes a description of wheel symbols and markings; factors governing tool room wheel selection, types of bonds used in the manufacture of the various wheels; and wheel structure. (Macklin Co.)

For free copy circle No. 6 on postcard

Tape-Controlled Lathe

Numerically controlled engine lathes are described in a 11-page bulletin. Tape controlled lathes can turn contours, tapers, sharp angles and facing cuts. Six tools are carried in the numerically controlled tool turret—enough to perform all roughing and finishing operations on most jobs. (R. K. LeBlond Machine Tool Co.)

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Infrared Heaters

A new line of electric infrared Comfort Heaters for direct radiant heating of hard-to-heat indoor and outdoor areas are described in an eight-page bulletin. Principles, advantages, and typical uses of electric infrared comfort heating are discussed. (Fostoria Corp.)

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Strips Compounds

New metal stripping compounds that effectively strip electroless nickel coatings from steel, magnesium base alloys, nickel phosphorous, copper, brass and copper base

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FREE LITERATURE

alloys by immersion only are fully described in a new series of Technical Data Sheets. (MacDermid Inc).

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Metal-O-Rings

A simple-to-use slide chart is available to assist design and production engineers in the specification of metal-o-rings. The slide rule chart covers ring diameters from ¼-50 in. and includes specifications for plain, plated and coated rings. (Advanced Products Co.)

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Steel Selection

"Three Keys to Satisfaction," a 77-page revised guide points up sound design principles, proper selection of steels and good heat treatment to achieve optimum economy and material performance. (Climax Molybdenum Co.)

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Basic Measuring

How is basic measuring accomplished? A new 60-page book takes the reader through a step by step, illustrated demonstration. (Jones & Lamson Machine Co.)

For free copy circle No. 12 on postcard

Conveyor Systems

How to plan and install your own conveying system, a 20-page bulletin which contains many typical installations. Specifications, charts and graph paper for self polishing are included. (Conveyor Systems Inc.)

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Turret Drilling

Six and eight-spindle turret drilling machines are described in a bulletin which details preselective speeds and feeds, automatic or tape controls. (The Avey Div., Motch & Merryweather Machinery Co.)

For free copy circle No. 14 on postcard

Silicone Rubber

The selection of the proper type of silicone rubber, for particular requirements, is possible through the use of a selector chart. The publication contains data on applications, typical properties, primary classes and industrial and military specifications. (General Electric Co.)

For free copy circle No. 15 on postcard

Vapor Degreasers

A four-page, illustrated bulletin describes vapor-spray-vapor degreasers. Principle of operation, solvent cycle and a table of specifications on all models are discussed. (Phillips Mfg. Co.)

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High-Purity Flux

Flux for melting operations is covered in a new four-page bulletin. It points up the flux's effectiveness, how waste is reduced and handling benefits. (Mineral Products Div., Glen-Gery Shale Brick Corp.)

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Design Data

Calculations for load carrying members of aluminum are covered in new, 232-page edition of structural aluminum design. The book includes tables of properties, applications and specifications, tables of maximum allowable stress values, high and low temperature properties, alloy data sheets, weight tables and other pertinent information.

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Turret Press

Over 100 costly factors simplified or eliminated by tape-controlled turret punch presses are listed in a new booklet. This helpful check list provides ample space for estimating annual cost reductions realized in every phase from design to assembly. (Wiedemann Machine Co.)

For free copy circle No. 19 on postcard

Rivet Sets and Dies

New process, punches, dies, rivet sets and compression riveter dies of every size and shape are illustrated by 145 sketches with complete description in the newly revised catalog. For quick reference there is included a valuable and handy stock list showing a complete selection of all tools. (G. F. Marchant Co.)

Allison-Campbell

ABRASIVE CUTTING KNOW-HOW

This 12-inch billet was cut in 14 minutes!

This speed is standard procedure with CAMPBELL wet abrasive cutting machines. The 14-minute example refers to a semi-finished carbon steel billet, but it's just as true for other metals. Even Rene 41 and Inconel X can be cut at 7 to 10 square inches per minute.

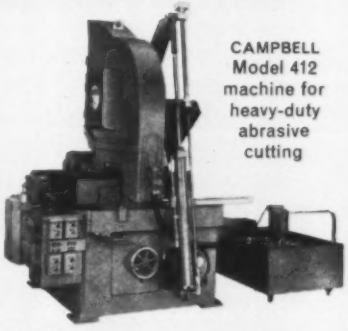
You get top quality, too • No burn, a surface suitable for metallurgical examination, and dimensional accuracy with modern abrasive cutting techniques.

The most economical way to cut • It's not uncommon to reduce cutting time from hours to mere minutes with CAMPBELL machines. Wheel cost is low, too.

Machines for heavy-duty jobs • ALLISON-CAMPBELL offers a wide selection of precision abrasive cutting machines. For the *big* jobs, the recommendation usually is either the CAMPBELL Model 481, with capacity up to 8" squares, or the CAMPBELL Model 412, which can cut 12" squares. Both of these machines have a unique coolant system for greater accuracy, better-quality cuts. Oscillation (the backward and forward motion of the wheel as it cuts through the work), speeds up production, increases wheel life.

For other cut-off jobs, there are four types of CAMPBELL machines in both wet and dry cutting models, with capacities and speeds to suit your own production needs. ALLISON-CAMPBELL also can supply the right wheels for any cut-off job.

Write for details. *For on-the-spot help, call in your* ALLISON-CAMPBELL *field engineer. He's an abrasive cutting specialist, ready to give expert advice.*



CAMPBELL Model 412 machine for heavy-duty abrasive cutting

Send us a sample

Send us samples of the materials you cut. We will make test cuts in our Abrasive Cutting Laboratory and return the samples to you with complete test data.

ACCO

CAMPBELL ABRASIVE CUTTING MACHINES

Allison-Campbell Division • American Chain & Cable Company, Inc.

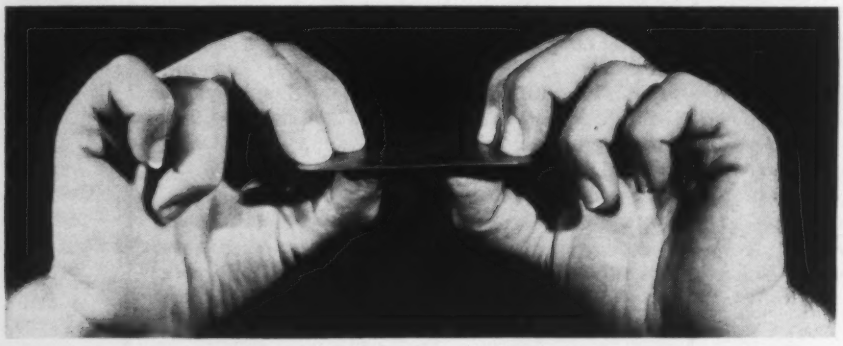
937 Connecticut Avenue, Bridgeport 2, Conn.

How Armco puts multiple

Strong sheet steel is given a .001-inch thick coating of aluminum on each side by a special Armco-developed hot-dip process. The result is Armco ALUMINIZED STEEL Type 1, a unique material with advantages of steel, features of aluminum, and bonus benefits all its own.

RESISTS HEAT AND CORROSION—ALUMINIZED STEEL Type 1 withstands temperatures up to 900 F without discoloration, to 1250 F without destructive scaling. It also resists corrosive condensates that form on cooling. Real advantages in mufflers, furnaces and similar products.

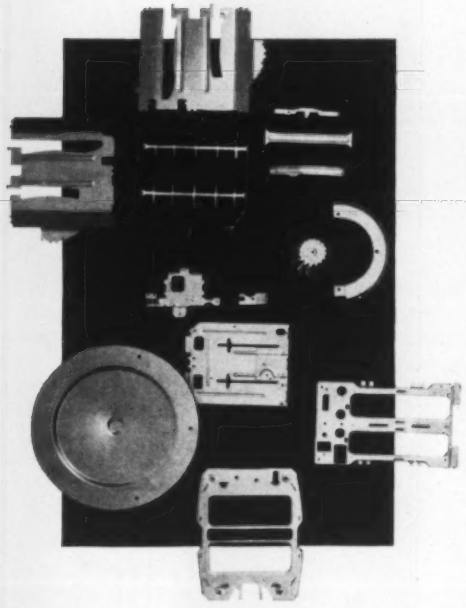
REFLECTS HEAT—To 900 F, ALUMINIZED STEEL reflects up to 80% of radiant heat, helps direct heat where you want it, cuts down heat loss. Hundreds of parts for large and small appliances are now proving the practical benefits of this heat reflectivity.



STAYS STRONG—Parts that resist or reflect heat can double as structural sections when made from Armco ALUMINIZED STEEL because it keeps its strength at high temperatures. This also permits thinner, more economical gages than with metals that weaken under heat.

New steels are born at Armco

Steel with an aluminum coating benefits at your fingertips



TAKES FABRICATION—Armco ALUMINIZED STEEL Type 1 withstands moderate forming, drawing and spinning operations without flaking or peeling of the coating or damage to base metal. This workability, coupled with its other outstanding properties, accounts for its successful use in a growing number of industrial, commercial, and consumer products.

Use this label to tell customers your products are made from modern, dependable steel.

SEND MORE DATA

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Please send further facts on Armco ALUMINIZED STEEL Type 1.

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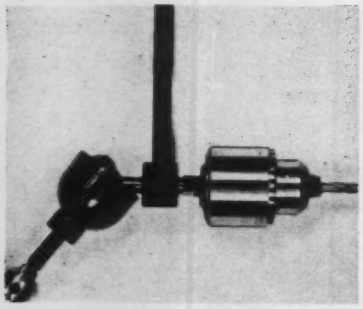
ARMCO **Armco Division**

New Materials and Components

Welding Flow Regulator Stops CO_2 Freeze-Up

Without other heat sources, an air-heated regulator avoids freeze-up of flow-control equipment in metal-arc welding. This is done by expanding the carbon dioxide gas through two stages of pressure reduction. The unit has a preset, one-stage regulator, a heat-exchange coil, a second stage of pressure reduction and a float-type flowmeter. This flowmeter regulator is good for most jobs where the flow and duty cycles are under 80 feet per hour. When the duty cycle is very high, a larger heat pick-up element is used. The regulator may be preset. No correction factor is required. Back pressure doesn't induce errors. (Air Reduction Co.)

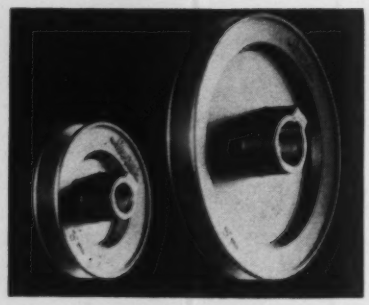
For more data circle No. 26 on postcard, p. 111



Adapter Lets Power-Drill "Turn the Corners"

Here's a unique drive unit that converts any power drill into a variable angle tool. The unit aids drilling in tight cramped quarters. It measures less than 6 in. overall and weighs about 12 oz. The drive unit fits all models of power drills with ¼ or ½ in. capacities and may be permanently installed on the drill by requesting a special adapter. Other models are available for impact and socket wrenches, also for tractor power take-offs and industrial uses where a universal joint is required. A removable, hand-grip bar is an accessory. (Glenwood Gyro-Drive, Inc.)

For more data circle No. 27 on postcard, p. 111



Pulley Line Offers More Strength

A new design results in a line of driver pulleys 20 pct stronger than previous models. This strength is gained by increasing the cross-section in the area where the pulley flanges merge. Most fatigue failures occur there. The higher strength to weight ratio is important where the drive mechanism is often overloaded. To insure static and dynamic balance, the pulleys are tested on a random-sample basis. Better balance promotes long life. Available in pulley diameters from 1½ to 16 in., the line has ½, ⅝, ¾, and 1 in. bores. (Tann Corp.)

For more data circle No. 28 on postcard, p. 111

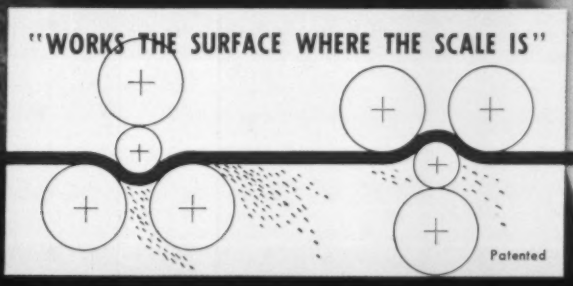
Combustion Indicator Monitors Flame

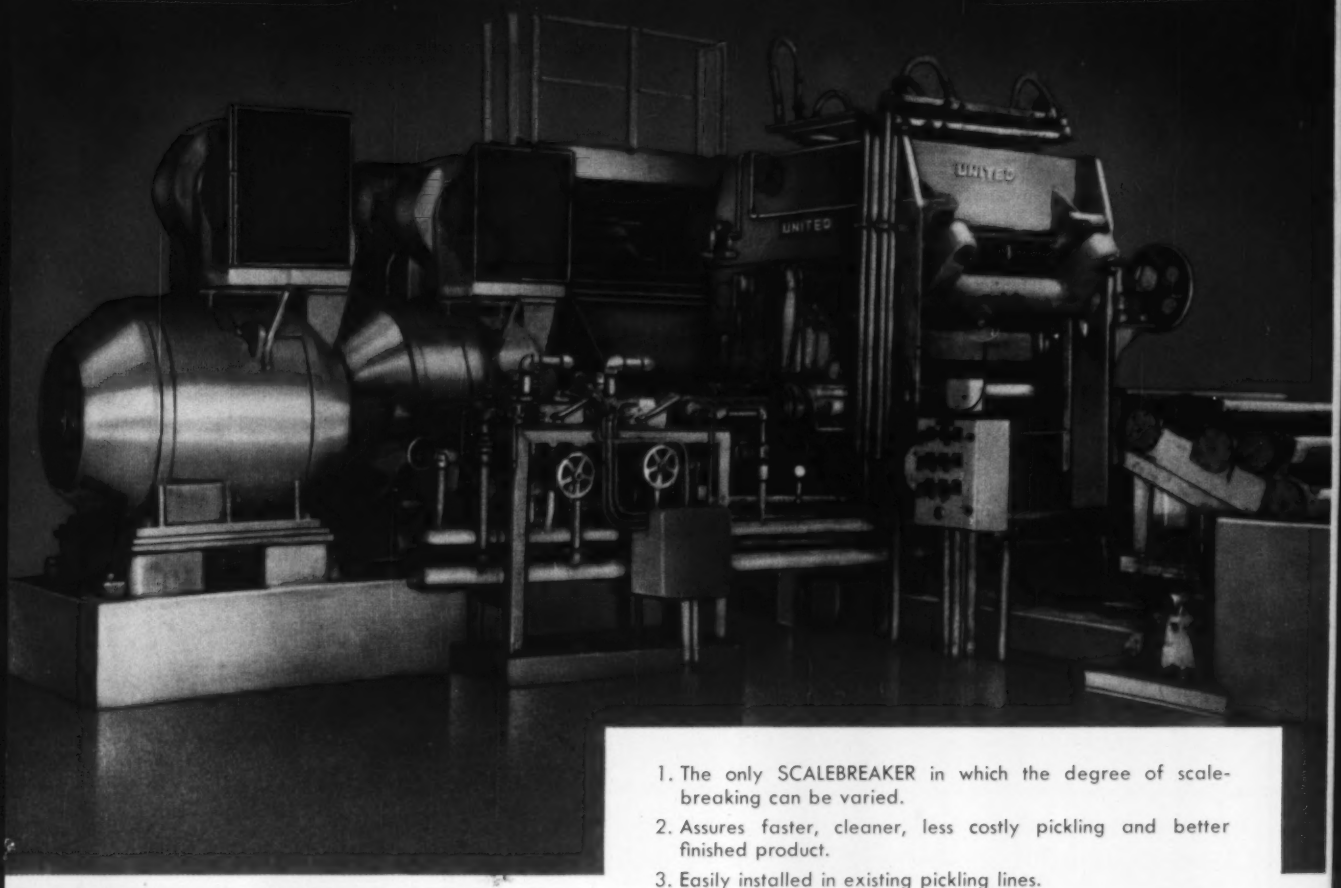
By presampling air-gas mixture, a new instrument indicates changes in flame characteristics. Designed for industrial use, the device permits adjustment of the air-gas ratio before production is adversely affected. It should be very useful where the transfer rate must be maintained to meet exacting time-temperature cycles. All the operator needs to do is keep the needle on zero. This will assure even combustion. The indicator detects changes as little as 5 Btu in fuel gas and 0.5 pct air in air-gas ratio. Typical industrial applications are in glass-bending lehrs, forging furnaces and aluminum brazing. The continuous-reading device senses changes in five seconds. (Selas Corp. of America)

For more data circle No. 29 on postcard, p. 111

UNITED®

Strip Processing
SCALEBREAKER





1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

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UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington

Subsidiaries: Adamson United Company, Akron, Ohio
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Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Quantity PRODUCTION of GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE

Sealer Expander

Lack of resilience, a prime drawback in the use of teflon as a sealing material, limits its uses. A solution to this problem is an internal expander which maintains a constant mechanical force against the sealing surface. (Tanner Engineering Co.)

For more data circle No. 30 on postcard, p. 111

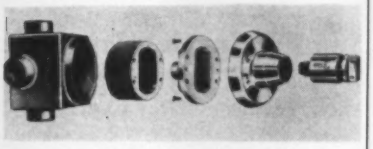
Tape Reader

A high-speed tape reader speeds data processing on automated machine. The unit's unique feature is its tape drive. A printed motor is used to advance the paper tape asynchronously at rates up to 300 lines per second without using brakes, clutches or pinch rollers. The reels are driven by printed motors which are switched on and off by magnetic circuitry. The elimination of mechanical members in the capstan and reel drives results in a simple transport.

For more data circle No. 31 on postcard, p. 111

Explosion-Proof Plug

For hazardous industrial atmosferes, a new electrical receptacle and plug prevents arcing when con-



nections are made or broken at wall outlets. The plug cannot be pulled out of the receptacle accidentally. It's washable, vapor-proof and water-proof. (Harvey-Hubble, Inc.)

For more data circle No. 32 on postcard, p. 111

Compact RPM Switches

A new multi-speed, rpm control switch, weighing 15 oz or less, is available in models with 1, 2, or 3 snap-action switches. Each can be set to actuate at a preset rpm. This permits the control of sequence operations which are a function of speed. The unit can also serve as a drive coupling for another component mounted to it. (Kahn and Co., Inc.)

For more data circle No. 33 on postcard, p. 111

COWLES

slitting knives and special purpose metal working tools

Scrap Chopper Blade

Roll Forming Tool

Roll Turning Plugs

Grooved Edging Roll

● Complete line of slitting and trimming knives in our job-proved **Max-Cut, Specialloy, Superalloy, Circle C** and **Super C** grades for slitting any high or low carbon, stainless, silicon or non-ferrous material. Complete range of sizes. Prompt delivery. Also carbide rimmed knives. Our precision manufacture and exacting heat treatment assure sharp, clean cuts; and long, dependable service with only infrequent downtime for re-grinding. Wide experience in designing and manufacturing Chopper Blades, Roll Forming tools and other special purpose tools for a wide variety of metal working operations.

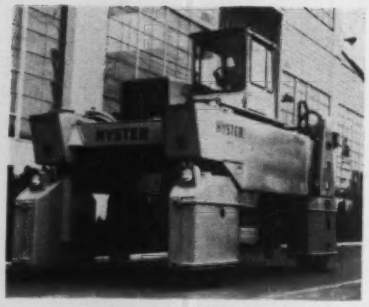
Specify "Cowles" rotary knives and special tools for every job. They'll make your work easier—and cut your costs.

Get full details. Write for Bulletin No. 571 Today.

COWLES TOOL COMPANY

2086 WEST 110th STREET • CLEVELAND 2, OHIO

New Equipment and Machinery



Carrier Safely Handles Loads up to 60,000 lb

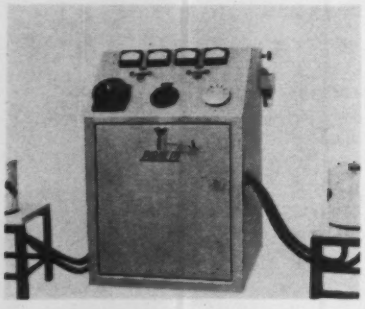
From road to roof, a new 30-ton straddle truck handles with the ease of a carrier half its size. The unit combines the concept of human engineering with top performance characteristics for fast, safe handling of loads up to 60,000 lb. The carrier is an all hydraulic lift system that eliminates mechanical linkage, sprockets, and chains. Two high-pressure pumps provide instant lift response. A specially designed flow meter equalizes the hydraulic pressure at the unit's four lift points. This in turn equalizes cylinder travel up or down. (Hyster Co.)

For more data circle No. 41 on postcard, p. 111

Grinding Unit Pulverizes Materials to —325 Mesh

This new grinding machine manipulates fast-moving air causing materials to grind themselves into particles of controlled size down to almost infinite fineness. The tonnage capacity of a given machine varies with different materials. A two-ton-per-hour (manganese capacity) unit is now in operation and a 5 ton-per-hour machine to custom-grind manganese, for use as a catalyst in Uranium recovery systems is under construction. Both machines are presently set to grind to —325 mesh which is finer than talcum powder. Cement, for example is 200 mesh. The unit can also be modified to separate fibrous materials, such as asbestos, into threads without crushing. (Hirsch Brothers Machinery Co.)

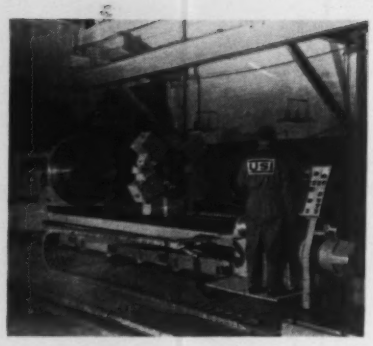
For more data circle No. 42 on postcard, p. 111



Motor Generator Powers Small Induction Furnaces

Completely self-contained, a new 15kw motor generator has been designed for induction melting jobs in the laboratory and low volume foundries. The power unit operates at constant coil voltages of 220-440 v. The unit's console occupies less than 10 sq ft of floor space, yet it contains everything necessary for operation of either of two induction melting furnaces or coils. This single pretested unit contains a new motor-generator set, capacitors, transformers and all necessary instruments and controls. The only connections are power and water. (Induction Corp.)

For more data circle No. 43 on postcard, p. 111



Heavy-Duty Lathe Turns 50-ft Long Bars

This giant, heavy-duty lathe can turn a part 40 in. in diameter. The machine's 66 ft length can tackle a 50-ft long bar between its centers. Built entirely of welded steel, the unit has been put together in two sections. This provides for easy handling. The lathe's headstock and bed are independent members. They are used in such a way that the entire structure gains rigidity. The drive, electrification, quick change gear box, and control console are removable as a unit—serviced as a unit. An automatic lubrication system supplies the bed and carriage ways with the proper lubricant at all times. (USI Clearing, Div. of U. S. Industries, Inc.)

For more data circle No. 44 on postcard, p. 111

Precision to:
+ .0002
− .0000

Stainless Steel
PINS
in STOCK
DOWEL&TAPER
IMMEDIATE SHIPMENT

DOWEL PINS
(precision tolerance)
- Stainless steel 18-8, type 303
- Diams: .0312 through .500
- Lengths: 3/32" through 2½"
- Chamfered ends
- "Specials" manufactured promptly
- Full range raw material on hand

TAPER PINS
(commercial, precision, AN)
- Stainless 18-8, type 303. Also many in type 316 (Commercial tolerance)
- Size: 9/0 through 10 in stock
- Lengths: 3/16" through 8" (not all lengths in all sizes.)
- "Specials" manufactured promptly, any material

PLUS all types and sizes of screws (slotted, Phillips–both magnetic and non-magnetic–hex, socket), bolts, nuts, washers, rivets, nails, keys, etc.

PHONE OR WRITE for prompt quotation or shipment. Ask for catalog.

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Manufacturers of Stainless Fasteners Since 1929
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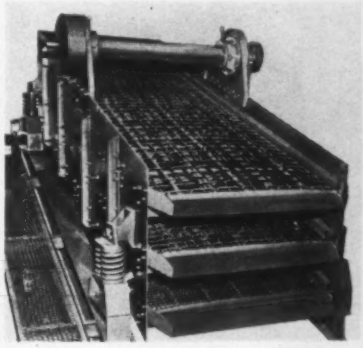
NEW EQUIPMENT

Two-Bearing Screen

New in every detail, an inclined vibrating screen is available in a complete range of screen sizes up to 6 by 16 ft. Slow, medium and fast screening is obtained by the simple adjustment of the entire vibrating

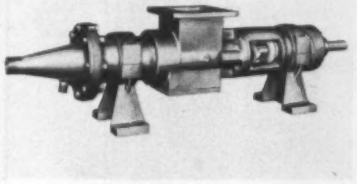


unit. Vibration amplitude is altered by adjusting weights. The entire mechanism has an oil lubrication system for all moving parts. (Aggregates Equipment, Inc.)

For more data circle No. 45 on postcard, p. 111

Conveys Powders

A new method to convey dry, powder-like materials through an enclosed piping system uses a pump to replace blowers, ducts and dust collectors. Performance capacities to date have ranged as high as 24,000 pounds per hour. The sys-



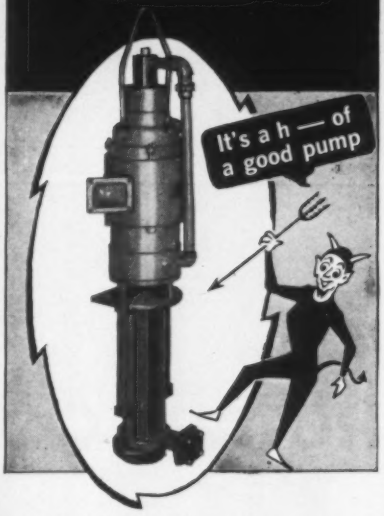
tem functions well in runs up to 200 ft and it can lift more than 75 ft. Like a piston moving through a cylinder of infinite length, its performance is smooth and free from turbulence with a uniform flow suitable for metering purposes. (Robbins & Myers, Inc.)

For more data circle No. 46 on postcard, p. 111

Portable Tester

Tensile tests up to 500 lb can be performed on a new portable instrument. This air-actuated unit is

Pump
MOLTEN METALS
Faster
Better
WITH
Gusher
MOLTEN
METAL
PUMPS



- SAVES TIME
- DOES A BETTER JOB
- REDUCES HAZARDS TO EMPLOYEES
- SPEEDS UP HANDLING OF MOLTEN METALS

Gusher Molten Metal Pumps are vertical centrifugal type pumps specifically designed for handling molten salts, lead, babbitt, solders and other alloys at temperatures up to 1000 F.

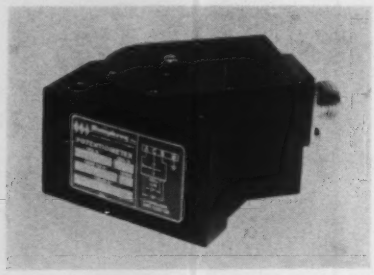
THE Ruthman
MACHINERY CO.
• COOLANT PUMPS
• CIRCULATORS • AGITATORS
• MOLTEN METAL PUMPS
1809-1823 Reading Rd., Cincinnati 2, Ohio

designed for bench mounting and easy operation. Its speed makes it ideal for production testing. Its accuracy, ½ pct of the full scale reading, makes it suitable for lab tensile measurements. (Hunter Spring Co.)

For more data circle No. 47 on postcard, p. 111

Sector Potentiometer

Qualified to meet missile requirements, a new circular-sector potentiometer measures small angular

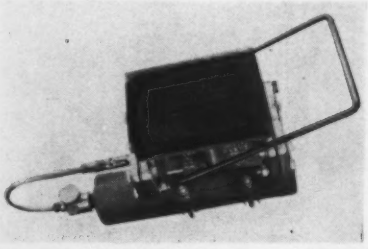


movements. It is accurate within 7.2′. The unit has an electrical travel of ±3°. Resolution is 0.5 pct. Service life exceeds 100,000 excursion cycles. Designed for feedback and instrumentation applications, it will withstand severe environmental conditions. (Humphrey, Inc.)

For more data circle No. 48 on postcard, p. 111

Infra-Red Burner

Completely portable, this new, gas-fired, infra-red burner is de-

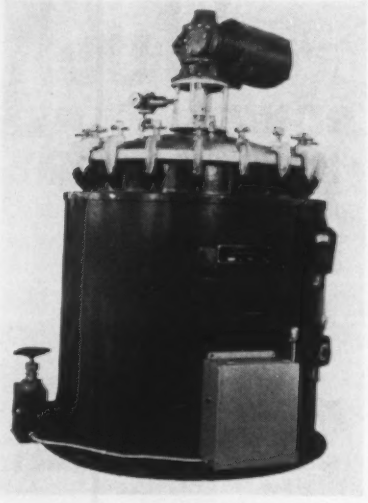


signed for research and testing of low-temperature industrial infra-red process applications. The unit operates for two hours on a self-contained propane gas supply. It is ideal for bench testing the practical use of infra-red in large-scale, drying operations, paint and enamel baking, and foundry curing. Face temperature of the 4 by 6 in. radiant screen can be varied from 1200 to 1800°F. (Bryant Industrial Products)

For more data circle No. 49 on postcard, p. 111

Low Pressure Tanks

Spraying, pressure or vacuum impregnating, and conveying melted compounds are principal uses of electrically - heated, low - pressure tanks. Often used when gravity flow is not possible or when pumping costs are prohibitive, these tanks deliver a smooth flow of thick material. Low concentration and even distribution of heat stops hot-spots. This is achieved by specially-wound,

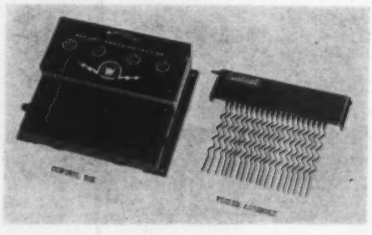


heating elements evenly applied in multiple circuits around the bottom and sides of the tank. (Sta-Warm Electric Co.)

For more data circle No. 50 on postcard, p. 111

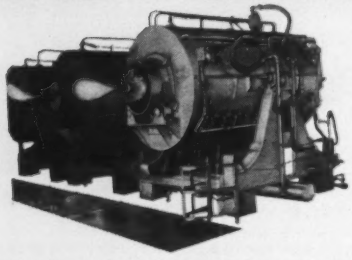
Protects Machinery

Designed for the protection of expensive dies and machinery, this missing-parts detector senses non-



ejection, misfeeding, buckling, end-of-material and overloading and stops equipment instantly. It's high-impedance feeler assembly is

AGF
ROTARY CARBURIZERS



AGF's Work in Motion Principle Assures Uniformity of Case!

AGF Rotary Batch Carburizers provide the most reliable method for DEEP CASE CARBURIZING and LIGHT CASE HARDENING.

Recent AGF combustion and control system improvements provide an even greater degree of temperature and product uniformity than was ever before possible.

For POSITIVE COST REDUCTION and PRODUCT IMPROVEMENT, investigate the NEW Improved AGF Rotary Carburizers.

Write for catalog IA 607 today

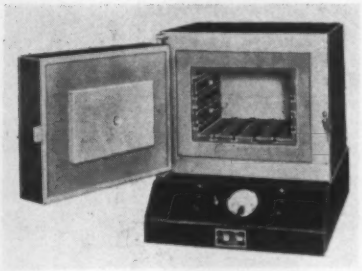
AMERICAN GAS FURNACE CO. 3004 LAFAYETTE STREET, ELIZABETH, N. J.

not affected by water, oil, etc. (Wintress Controls)

For more data circle No. 51 on postcard, p. 111

Industrial Furnaces

Each electric furnace is equipped with a temperature-indicating pyrometer, two thermocouples and a

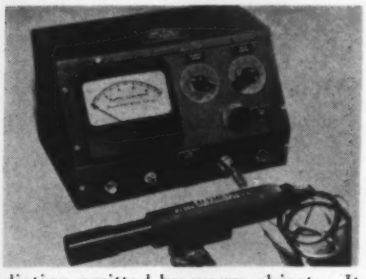


selector switch. Infinite zone-control switches control the rate of temperature input. These switches allow complete and accurate equalization of vertical-zone temperatures at any time-temperature curve. Any temperature between 500 and 2300°F can be maintained to a ±3°F dead zone or control band. Bench and floor units are available. (L & L Mfg. Co.)

For more data circle No. 52 on postcard, p. 111

Infra-Red Monitor

To control production heating processes, a new, non-contacting radiation monitor senses infra-red ra-



diation emitted by warm objects. It is available in the low temperature range of 500-1200°F and higher. Small or moving targets can be detected. Recommended uses for the unit are the control of extrusion, plastic forming, glass sealing, heat treating, soldering and low temperature brazing operations. (Mason Instrument Co.)

For more data circle No. 53 on postcard, p. 111

Rust Inhibitor

A non-oily type, synthetic-polymer, rust inhibitor can be used on

Princess Wenatchee, Chief Keokuk, and Junior,
Each have a favorite pig,
To which would you award the prize,
Small, Medium, or *BIG?*

When you think of SILICON . . . think of KEMCO!

KEMCO SILVERY PIG IRON

SILICON METAL - OTHER FERROALLOYS

Small . . . 12½ pound piglets
Medium . . . 30 pound pigs
Large . . . 60 pound pigs

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The superior form of silicon introduction . . . available in 60 and 30 lb. pigs and 12½ lb. piglets . . . In regular analysis or alloyed with other elements. For uniform high purity, aluminum producers specify Kemco Silicon Metal.

both ferrous and non-ferrous metal surfaces. It is particularly recommended for steel. You can use the inhibitor without a primer coat. It will stop underfilm corrosion caused by voids or breaks in the paint. Rust is inhibited for 30 days to six months, depending upon application and exposure conditions. Other features of this new material include fast air drying time (3 to 10 minutes) and ease of application. (Surface Research Corp.)

For more data circle No. 54 on postcard, p. 111

Quiet Vacuum Cleaner

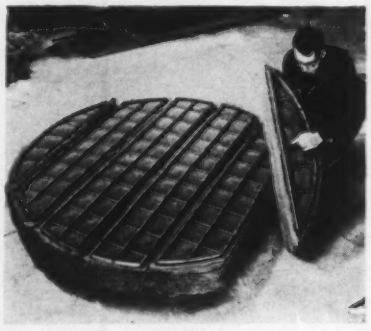
Gasoline and LP powered mobile vacuum floor cleaning machines are now available made with a special automotive-type silencer muffler. This new muffler silences almost all exhaust noise. Its expansion chamber is 9 in. long, 9 in. deep and 3 in. thick. The unit provides fast, dust-free and economical suction cleaning of large and small floor areas. It cleans up all sorts of dust,

dirt, trash and shavings at speeds up to 20,000 square feet an hour. (Handling Devices Co., Inc.)

For more data circle No. 55 on postcard, p. 111

Stack Mist Separator

Chemical plants are often the victims of law suits because of damages caused by escaping acid mists. A new wire-mesh, entrainment separator reduces mist concentration to less than 1 mg of acid per cu ft of



air. Pressure drop is less than 3 in. of water. An added bonus: The unit recovers acid mists that were blown out the stack. Savings are made on recovered acid and reduced maintenance of plant equipment. (Carpenter Steel Co.)

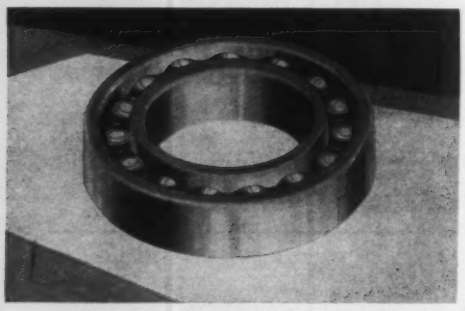
For more data circle No. 56 on postcard, p. 111

Blister Packaging

A new machine forms, fills and seals in one, complete, automatic operation. It forms a "blister" from a strip of thermoplastic film (sup-

NON-FLUID OIL
TRADE MARK REGISTERED

Ordinary grease works out



NON-FLUID OIL stays in bearings

Use of ordinary greases for ball bearing lubrication can result in excessive wear, early failure and costly shutdown for repairs. Because of their nature they work out of ball bearings, leaving finely polished balls and races without lubrication.

NON-FLUID OIL, however, stays in bearings until entirely consumed and guarantees protective lubricant film at every point where metal-to-metal contact could set up friction. It contains nothing that can decompose and liberate fatty acids to damage bearings.

NON-FLUID OIL "stays alive" longer in bearings than ordinary grease and this fact coupled with its longer lasting properties and more effective lubrication has resulted in approval by most leading manufacturers of anti-friction bearings.

Write for a free testing sample and Bulletin No. 506

1896 65 YEARS 1961 — 65 YEARS OF LUBRICATION SERVICE TO INDUSTRY

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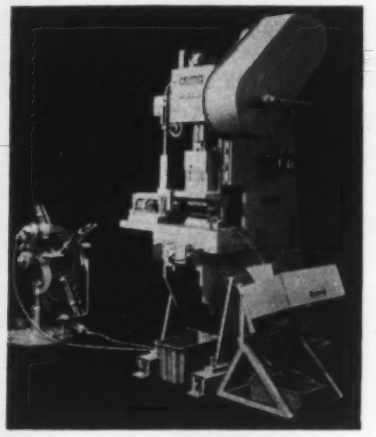
NON-FLUID OIL is not the name of a general class of lubricants but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly.

plied from a roll). The product to be enclosed is placed in the blister either manually or automatically by means of a feeding device. The strip of filled blisters is sealed to a backing material and cut off into single or pre-counted multiple packages. Almost any thermoplastic film may be used. The transparent package provides sealed protection for delicate components or small precision parts. Backing (sealing) material may be printed on one or both sides. Visible inspection is possible at all times—at point-of-sale or for in-plant inventory control. (Product Packaging Engr.)

For more data circle No. 57 on postcard, p. 111

High-Speed Presses

More than one million parts per day, at operating speeds up to 1000 strokes per minute, are possible



with this new line of automatic OBI presses. They are made in 22-, 35-, 45- and 60-ton capacities. Shaft sizes range from 2½ to 4 in. Enclosed drives (non-geared and single-geared) give safe, clean operation and improve appearance. Slides are designed for precision stamping work. (Niagara Machine & Tool Works)

For more data circle No. 58 on postcard, p. 111

Shock Absorber

A liquid spring shock, using liquid compressibility, has recently been announced. It is designed to stop a fully loaded freight car or missile rail car, going up to 12 mph, without impact. Shock action increases to keep loads minimum at all velocities. The all liquid content provides full dampening in any attitude. At 18 in. travel, rated energy absorption is 460,000 ft-lb. Preload spring force is 16,000 lb with an endload of 32,000 lb for restoring position. (Taylor Devices, Inc.)

For more data circle No. 59 on postcard, p. 111

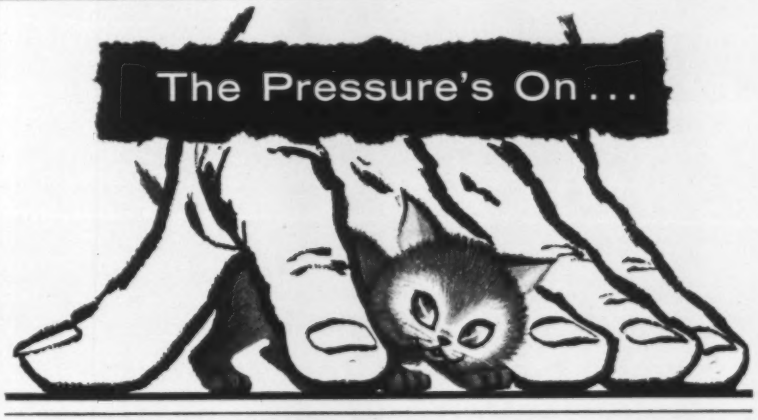
Resistant Nameplates

Combining the properties of porcelain enamel with metal, new porcelain nameplates may be individually stamped or bent to conform to equipment contours. Resistant to various corrosive fluids and severe environments, they may be drilled, bent, formed, cut or stamped. The vitreous enamel will not chip or break away from the metal. The plates are available in any desired color combination or design. (Erie Ceramic Arts Co.)

For more data circle No. 60 on postcard, p. 111

Electric Sprayer

A portable, refillable, electric "aerosol" sprayer has been designed



with Sof-Loc* HYDRAULIC HOLDDOWN SYSTEM

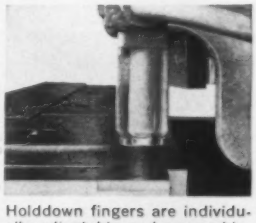
...GENTLE but POSITIVE

...exclusive on Lodge & Shipley POWER SQUARING SHEARS

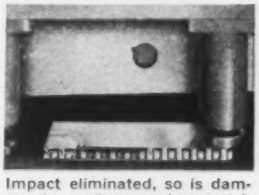
Tons of pressure, but applied so gently and quickly... using air for speed, oil for pressure... that's the secret of the exclusive Lodge & Shipley Sof-Loc Holddown. Quietly, without damage to easily marred surfaces, it gives unequalled holding power for fast, "dead accurate" shearing of light sheets or heavy plates.

Sof-Loc is but one of a combination of features you need but won't find on any other shear. These features and the advantages they give are described in a new 20-page catalog of Lodge & Shipley Shears: capacities from 10 gauge to ⅜" for heavy duty and high production shearing.

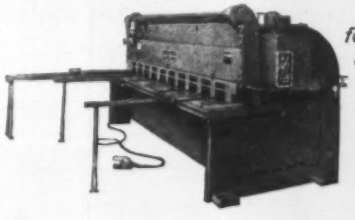
Request Bulletin S-347 from: The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.



Holddown fingers are individually adjustable and removable.



Impact eliminated, so is damage to easily-marred material.



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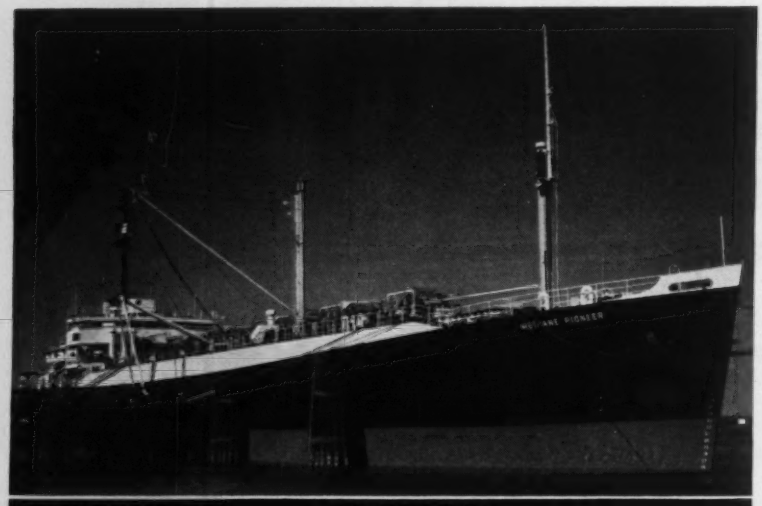


Job report courtesy of
Conch Methane Co., Ltd.

when pipe joints must be completely dependable at minus 258°F

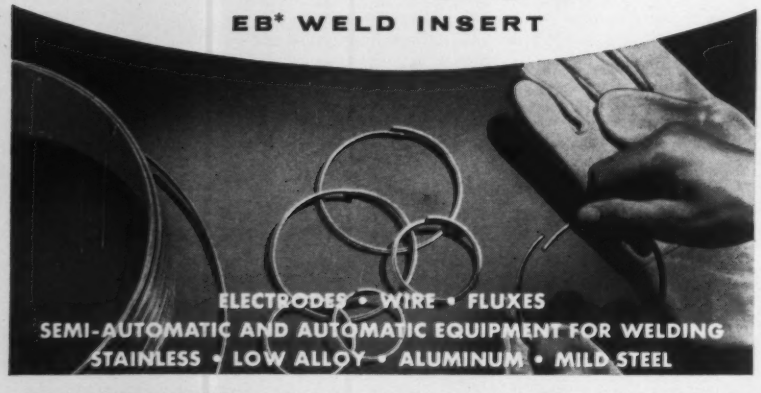
The engineers who successfully "broke through" the problem of handling liquefied methane gas on and off the "METHANE PIONEER" at minus 258°F had to "play it safe" in every respect. To provide unquestionably *safe* stainless pipe joints, Arcos EB Consumable Weld Inserts were used to make the important root passes.

EB Inserts permit welding to be done from one side only. They eliminate back-up ring obstruction and produce a smooth inside contour to expedite gas flow. If you are not familiar with the advantages of EB Weld Insert for "tough" pipe joining problems, write ARCOS.

*Trademark of General Dynamics Corp.

WELD WITH ARCOS

EB* WELD INSERT



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STAINLESS • LOW ALLOY • ALUMINUM • MILD STEEL

ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

NEW EQUIPMENT

for manufacturing and maintenance jobs. The sprayer will handle light oils, water, lubricants, rust inhibitors, sealers, coatings, coolants, ad-

hesives and dyes. The unit is 6¼ in. tall; 2½ in. in diameter. It weighs only 12 oz. It's self-contained and ready to use and comes complete with a six-foot length of cord. (Burgess Vibrocrafters, Inc.)

For more data circle No. 70 on postcard, p. 111

New 25-Ton Crane

Featuring a "full circle" visibility cab and power outriggers, a new mobile crane provides 15 speeds forward up to 47 mph. There are three speeds in reverse. The turn-

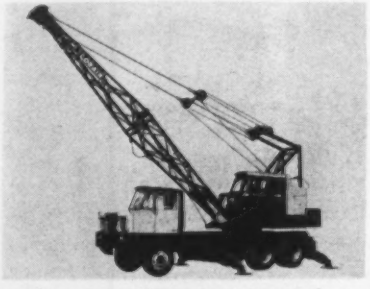


table connection supports and rotates the turntable on a circle of steel balls and eliminates adjustment, maintenance and lubrication problems. Gasoline or diesel engines are available on the crane. (Thew Shovel Co.)

For more data circle No. 71 on postcard, p. 111

Air Impact Wrench

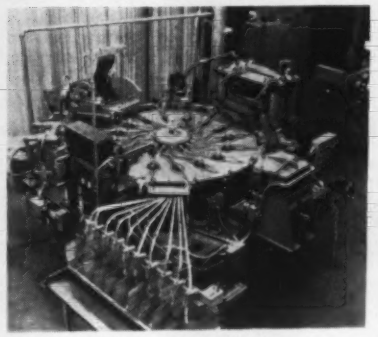
In an air impact wrench, an improved air motor and housing is

coupled with an impact mechanism. Air entry is through a ½-in. outlet. Streamlined housing insures free air flow with minimum restriction. With more air moving at higher speeds, the wrench accelerates rapidly for faster rundown. (Albertson & Co., Inc.)

For more data circle No. 72 on postcard, p. 111

Makes Splices

This complex machine makes "E" splices for joining telephone



cable connections. It was operated on a production-contract basis for Western Electric. Production of 12,000 units per hour is possible at maximum efficiency. Cycle time: 3 seconds. Many standardized components were used in its design. (Gilman Engr. & Mfgr. Co.)

For more data circle No. 73 on postcard, p. 111

Power Cutter

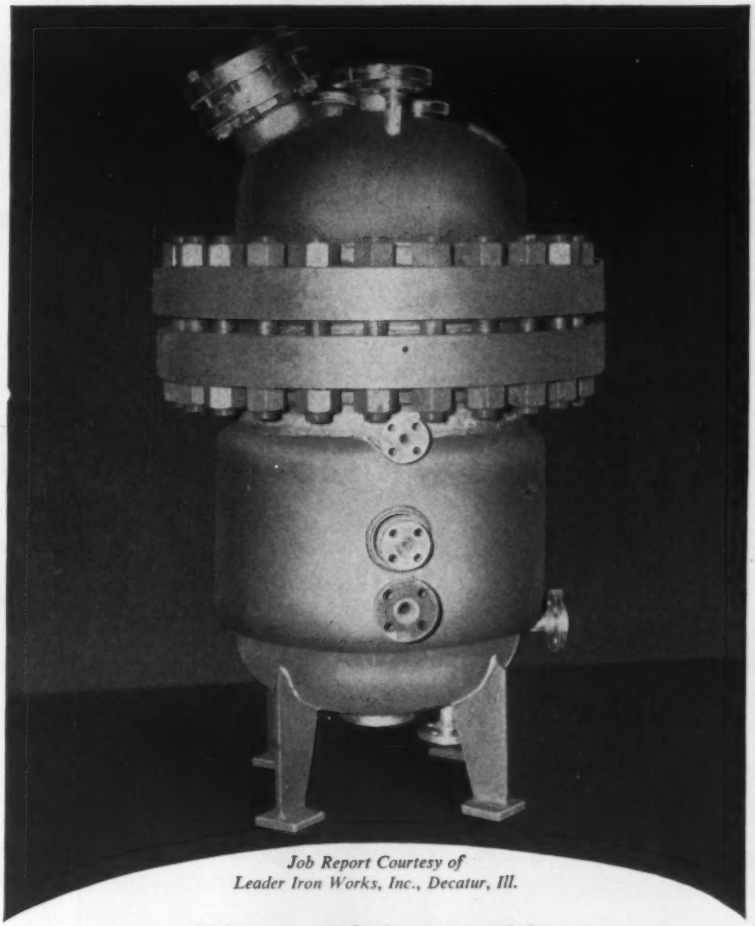
Easily adapted to special operations, a cutting and forming machine accomplishes circular, straight and free-hand cutting and louvre. It cuts segments, rings and all shapes requiring specific arcs. It also cuts curved or corrugated sheets with no deformation at all. (Hedstrom Tool Co.)

For more data circle No. 74 on postcard, p. 111

Melting Tanks

Directly and indirectly heated, a line of industrial heating tanks features full insulation and fused link closing device. It has an easy-reading thermometer. Sizes are from 1-695 gal. It can be heated by electricity or any type of gas. (Aeroil Products Co., Inc.)

For more data circle No. 75 on postcard, p. 111



Job Report Courtesy of
Leader Iron Works, Inc., Decatur, Ill.

When stainless welds must also resist heat and pressure

This sturdy autoclave made of Type 316 stainless steel must operate under pressures up to 1000 psi at 600°F. Code specifications called for X-ray quality weld. To meet all these conditions for successful and long performance Arcos Chromend KMo (Type 316) electrodes were used for joint fabrication. When you use Arcos Stainless Electrodes you can always count on their providing multiple benefits.

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for quality weld metal

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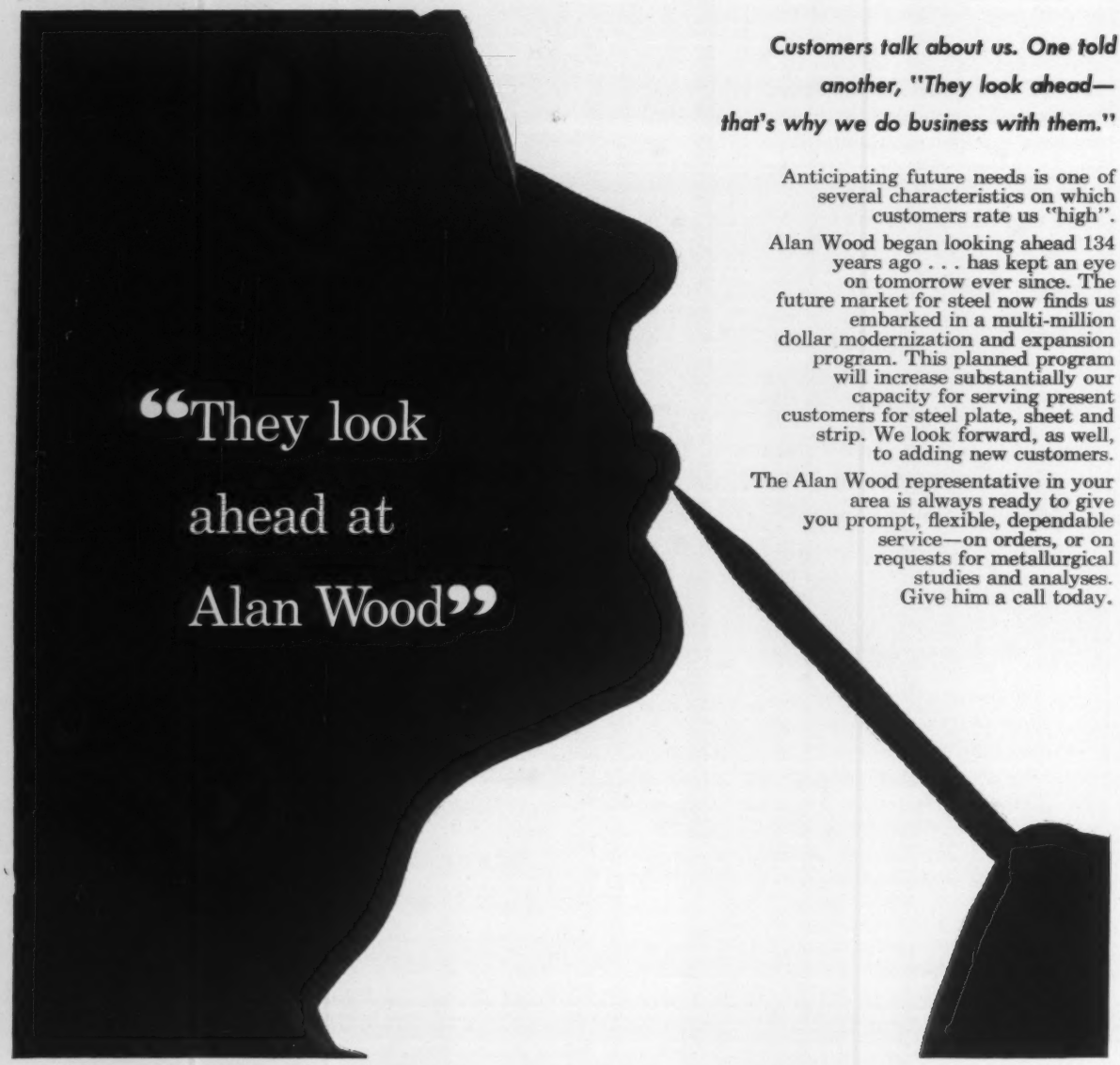

Customers talk about us. One told another, "They look ahead—that's why we do business with them."

Anticipating future needs is one of several characteristics on which customers rate us "high".

Alan Wood began looking ahead 134 years ago . . . has kept an eye on tomorrow ever since. The future market for steel now finds us embarked in a multi-million dollar modernization and expansion program. This planned program will increase substantially our capacity for serving present customers for steel plate, sheet and strip. We look forward, as well, to adding new customers.

The Alan Wood representative in your area is always ready to give you prompt, flexible, dependable service—on orders, or on requests for metallurgical studies and analyses. Give him a call today.

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Upturn Set Back Indefinitely

An upturn this spring in steel production is largely wishful thinking. The signs just aren't there.

Mills are under pressure to trim prices. But, to date at least, the line is held at the mill.

■ There is little in the steel market picture to point to a quick improvement in steel production.

Instead, the market is drifting with little change in the pattern of recent weeks. Automotive cutbacks are counter-balanced by miscellaneous orders. But no real upturn can be expected until there is a pickup in orders from the major steel consumers.

No About-Face—And, there are no indications this week of any about-face on the part of the big users. These include: Automotive; oil and gas; railroads; warehouses; and independent stampers.

April and May are now mentioned in the industry as possible recovery months. But this is only because there is no change in sight for March. As each week goes by without any indication of recovery, the eventual date of the upturn is set back.

Prices Under Pressure — Meanwhile, steel prices are tested continually. So far, there has been no break. But pressure is reflected in price cuts this week in some export prices, although new export prices remain above domestic levels.

A special check by IRON AGE reporters failed to uncover any mill price cutting. So far, the only cutting in the domestic market is at the warehouses.

At the mill level, there are reports of prime steel being sold as seconds, and of extras conveniently dropped. But these cases are vague and hard to prove. Many of the price weakness rumors come from users who are trying to crack the price front.

Miscellaneous Help — On the positive side of the market, the bulge in new miscellaneous business is really more substantial than generally believed. This is because the full extent of automotive cutbacks is not fully understood. Added miscellaneous business dropped into the gap left by cancelled or set-back auto tonnage, leaving little visible impact.

If auto cutbacks had not been so severe, the market for the first quarter of the year would have shown a respectable improvement. Instead, it has barely held its own in total tonnage, although the balance has shifted from flat-rolled automotive tonnage to a wider range of products.

Automotive Outlook Dim—The automotive steel market looks even worse this week. Most of the steel suppliers are feeling the effects of auto companies' one and two-week shutdowns. A new round of cancellations and setbacks arrived last week.

One representative company says February automotive tonnage will be about the same as January, but that things look bleak for March and April. March tonnage shipped to the auto industry by this mill will be several thousands lower than February.

One steel company was asked by a Big Three Div. to put February steel into March; now it's asking March to be shifted to April. Some companies take a dim view of the rest of the automotive model year, with only spot orders after March.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	84	80	82	139
Buffalo	74	74	73	143
Pittsburgh	75	70	70	142
Youngstown	83	84	76	151
Cleveland	77	78	77	171
Detroit	91	86	102	148
Chicago	91	90	87	145
Cincinnati	92	85	87	140
St. Louis	105	99	85	130
Southern	88	75	80	127
Western	99	101	84	141
U. S. Index	84.9	81.8	80.5	143.5

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,582	1,524	10,406	18,930
Ingot Index				
(1957-59=100)	84.9	81.8	79.8	145.2
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel, base (cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$33.50	$33.50	$31.50	$37.17
No. 2 bundles	$23.83	$23.83	$22.17	$23.50

Outlook for Conveyors: Stability

Slightly higher sales but few new products are forecast for the conveyor industry.

An IRON AGE spot check of manufacturers shows varying predictions. But none expect any great slump.

■ This year could result in slightly higher sales but very few new products for the conveyor industry. It follows the pattern of sales that moved sideways last year.

The IRON AGE conducted an extensive survey in December of all conveyor, crane and hoist plants that employ at least 50 production workers (IA, Jan. 5, p. 132). The result showed: Nearly 75 pct of those responding said sales will remain the same or go higher; the selling price of equipment, according to 90 pct, will also increase slightly; at least 80 pct reported profits will remain the same as in 1960, or drop slightly.

A more recent spot-check of some conveyor manufacturers reveals that the industry, excluding cranes and hoists, will probably boost sales just a little. Conveyor sales last year were approximately $320 million. And this was almost identical to 1959 billings.

Same Story — The Conveyor Equipment Manufacturers Assn. predicts 1961 "will add up to the same dollar volume for conveyors as in the past two years."

Manufacturers' predictions vary of course. Logan Co., Louisville, for example, says it expects sales to continue a slight downward trend during the first half, with some recovery in the second half. The overall picture for Logan's year is expected to reflect a 5 pct drop.

On the other hand, Joy Manufacturing Co., Pittsburgh, looks for sales this year to increase as much as 25 pct over 1960.

Lamson Corp., Syracuse, N. Y., says billings won't change.

Regarding new products, CEMA notes: "There are few wholly new products in the conveyor field, although there has been considerable development and refinement on established types."

New Development—The association says there is a trend toward deeper troughing of belts for handling bulk material. Belt construction has now been developed to the point where 30° and 45° troughing is feasible.

Says CEMA: "The result is that the cross-section of material being handled is deepened so that narrower belts may be used with attendant savings in machinery and structure as well as in the belts themselves."

Developments in this area should have a bolstering effect on sales. The bulk materials handling field has been highly competitive, particularly in the large, engineered conveyor installations.

Look for Changes — Though new products, as such, won't have much of an impact on sales this year, look for changes by 1962.

THE SAME STORY: Conveyor manufacturers say 1961 will show only slight increases in sales and very few new products. However, there are several areas, including automation, where developments will have a market bearing in the next several years. Bulk material markets are competitive.

POLYPENCO

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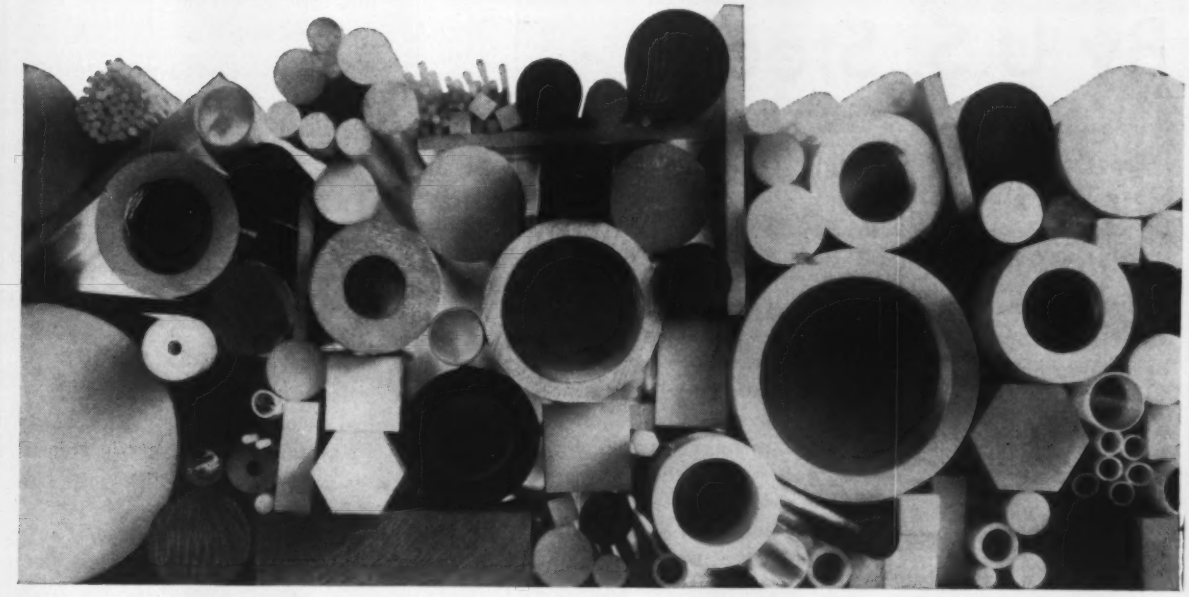

Assorted shapes of POLYPENCO Nylon and NYLATRON GS, Teflon† TFE, FLUOROSINT TFE, Q-200.5, Penton‡, Polycarbonate

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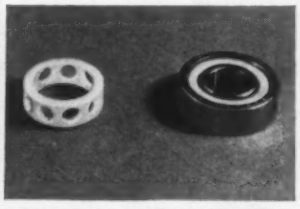

Sintered Parts of FLUOROSINT® TFE-fluorocarbon base composition NYLASINT® Sintered nylon parts and FERROTRON® ferromagnetic material

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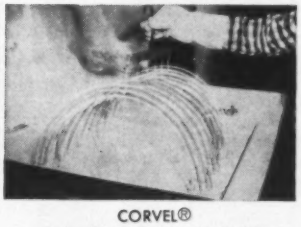

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Export Prices Cut By U.S. Steel

Export prices for several heavy steel products were cut by 25¢ to 37¢ per 100 lb by U. S. Steel Corp.

However, the new prices are still higher than either domestic or foreign prices.

■ United States Steel Export Co. has cut export price bases on several heavy steel products by 25¢ to 37¢ per 100 lb. The company said the reductions, effective Feb. 18, have been made to meet competition from other domestic mills.

Standard structural shapes, and C. B. sections and bearing piles were reduced in price from $5.98 to a new price base of $5.73 per 100 lb. Plates were cut to $5.38 per 100 lb from $5.75. The new export price bases apply F.A.S. vessel at New York, Philadelphia or Baltimore.

Others Consider Prices—Despite the reductions, amounting to between 4 pct and 5 pct, the new export prices are still higher than domestic prices. They are also higher than foreign prices.

The export subsidiary of U. S. Steel Corp. says that some domestic producers have been selling the affected products at less than the established price.

As of the beginning of the week, other steel producers had not followed U. S. Steel's move. However, there were indications that they were considering similar moves.

Sheet and Strip—Reports persist that at least one or two mills located in the **Midwest** are trying to sell sheet along the **East Coast.** No real lift has been noticed by **Pittsburgh** mills. They report galvanized is beginning to move up seasonally. And miscellaneous orders are taking up a little of the slack.

Pipe and Tubing — Warmer weather is expected to raise the drilling rate a little and **Pittsburgh** mills say inventory liquidation should be completed by April. There are reports from **Cleveland** of a pickup in orders from distributors for builders pipe as they start to rebuild stocks.

Wire—A seasonal swing to construction products is being felt in **Cleveland** where distributors are building up stocks of nails and other wire products. Some progress is being made against imports. U. S. mills can offer fast delivery. And lately, import prices have begun creeping higher.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	2–5 wks	2–4 wks	2–4 wks	1–4 wks	1–3 wks	4–5 wks
HR Carbon Sheet	2–4 wks	2–4 wks	1–3 wks	1–3 wks	1–3 wks	4 wks
CR Carbon Strip	2–5 wks	3–5 wks	2–4 wks	1–4 wks	2–3 wks	4 wks
HR Carbon Strip	2–4 wks	2–4 wks	1–3 wks	1–3 wks	2–3 wks	4–5 wks
HR Carbon Bars	1–4 wks	1–3 wks	1–4 wks	1–4 wks	Stock–3 wks	3–4 wks
CF Carbon Bars	1–4 wks	1–3 wks	Stock–4 wks	1–5 wks	1–4 wks	1–2 wks
Heavy Plate	1–3 wks	1–2 wks			1–2 wks	5 wks
Light Plate	1–3 wks	1–2 wks	1–3 wks		1–2 wks	4 wks
Merchant Wire	Stock	Stock	Stock		1–2 wks	2 wks
Oil Country Goods	Stock	Stock	Stock		Stock–1 wk	
Linepipe	Stock	1–4 wks	Stock		2–3 wks	2–3 wks
Buttweld Pipe	Stock	Stock	Stock	Stock	1–2 wks	Stock
Std. Structurals	1–4 wks	1–2 wks	1–4 wks	1–4 wks	1–2 wks	Stock–4 wks
Cr Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–1–4 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–3 wks	Stock–1–4 wks		

New Stainless Alloys

Intensity of the battle for stainless steel markets, particularly where it's used as trim, is pointed up by the announcements of two new alloys.

Allegheny Ludlum Steel Corp. has developed a new stainless steel alloy called Type 433. Basically, it is Type 430 stainless with molybdenum and copper added, which are said to give it better corrosion resistance.

Columbium Added — Universal-Cyclops Steel Corp. is also introducing a new stainless alloy which it calls Uniloy 430MR (see story p. 96). It is Type 430 stainless, modified through the addition of columbium. This is said to give better formability.

Allegheny Ludlum's Type 433 is available in the same gages and sizes as Type 430. It's rolled on the same equipment and can be bright annealed. The cost will be the same as Type 430. Consequently, it is possible that the auto industry will switch to Type 433.

Aimed at Autos—Initially, it was developed for the auto industry. And it is now undergoing tests by General Motors Corp., Ford Motor Co., and Chrysler Corp.

However, it is also expected to find use in other markets such as architectural, furniture and appliances, and for just about any use now made of Type 430.

COMPARISON OF PRICES

(Effective February 20, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Feb. 20 1961	Feb. 13 1961	Jan. 23 1961	Feb. 23 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Feb. 20 1961	Feb. 13 1961	Jan. 23 1961	Feb. 23 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composites: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50	$31.50	$29.50	$38.50
No. 1 steel, Phila. area	38.50	38.50	35.50	37.50
No. 1 steel, Chicago	30.50	30.50	29.50	35.50
No. 1 bundles, Detroit	29.50*	28.50	26.50	34.50
Low phos., Youngstown	36.00*	34.50	34.50	43.50
No. 1 mach'y cast, Pittsburgh	44.50	44.50	44.50	55.50
No. 1 mach'y cast, Phila.	49.50*	48.50	48.50	52.50
No. 1 mach'y cast, Chicago	46.50	46.50	45.50	56.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$33.50	$33.50	$31.50	$37.17
No. 2 bundles	23.83	23.83	22.17	23.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	33.00
Copper, Lake, Conn.	29.00	29.00	29.00	33.00
Tin, Straits, N. Y.	100.50†	100.50	100.50	102.25
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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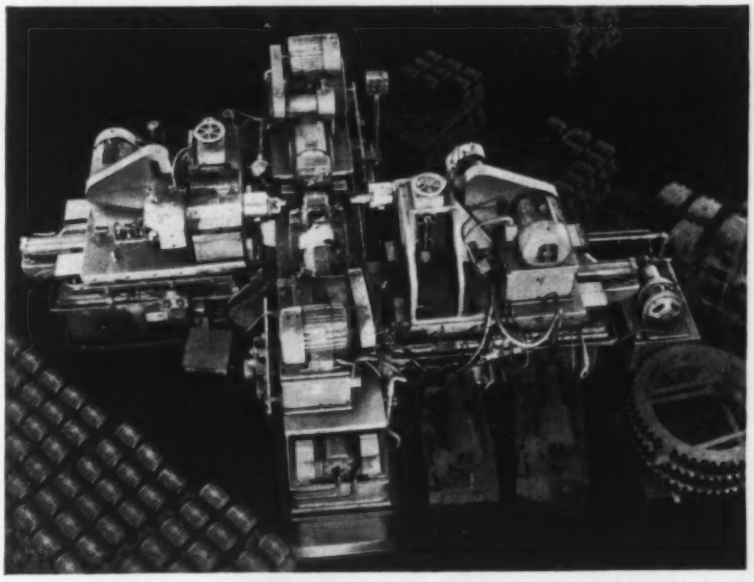
***Appears in the Feb. 16-March 2 issues.**



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Long life and low maintenance costs in a speed reducer are direct results of original accuracy and quality. Cone-Drive speed reducer housings are machined on this special 4-way boring machine to "tenths", assuring exact alignment of the **double-enveloping worm** and gear used.

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CONE-DRIVE GEARS

DIVISION MICHIGAN TOOL CO.
7171 E. McNichols Rd., Detroit 12

Market Poised For Upward Move

Strong export demand, low dealer inventories and recent bad weather have combined to make scrapmen bullish.

Most dealers feel prices are poised for an upward move. Even light domestic interest may trigger this climb.

■ Scrap prices in most key areas this week remain unchanged or increased only slightly. However, the market seems poised for additional increases.

The big factor is still continued export demand (see p. 70). Many dealers feel mills will have to start buying soon if only in limited amounts. Export demand, therefore, has made dealers bullish. Prices, they say, will rise with increased domestic interest.

On top of this, most yards are low on inventory. Bad weather and auto cutbacks have slowed scrap generation. Those mills wanting scrap must pay premium prices. But this situation will probably change with the better weather.

Reports from Pittsburgh, Cleveland and Detroit say dealers anticipate stronger markets soon and are holding out for higher prices.

Pittsburgh—The market continues quiet, but tight. There is no increase in buying volume, but it is becoming more difficult to meet the small local demand. Dealers anticipate a stronger market and are in no mood to sell. Auto cutbacks are reducing the flow of production scrap and export is draining off premium grades. Only a slight increase in mill demand is needed to push prices higher. More optimistic reports of steel sales have encouraged the belief demand will increase.

Chicago—The market is holding firm with only minor advances. Continued offers to purchase export scrap, combined with low scrap collections that are running 25 to 40 pct below normal, encourage dealers to hold scrap in the yards. Further price advances are expected. At least, $32.50 was offered for No. 1 heavy melting on an export order recently.

Philadelphia — The market remains firm with continued strength in exporting. Material is starting to flow into scrap delears' yards. This may mean a tapering-off of prices in the near future. Much still depends on what the Japanese will buy.

New York — Steelmaking grades are up $1 on appraisal and on the strength in the adjacent Philadelphia market. The spread between the two markets apparently makes it economical to buy in New York for export or consumption in Philadelphia. Preventing this on any major scale is soft domestic demand.

Detroit — Continued export inquiries lend the market an undercurrent of strength. Domestic interest is unchanged. Exporters are expected to set the prices on March's industrial list. Interest centers on No. 1 grades. Busheling is said to be getting little play. Although there's little buying, the position of stainless may strengthen. Meanwhile, scrap output by auto companies keeps falling.

Cleveland—The area is still trying to adjust to the influence of export speculation. Although local mills are still not interested in large tonnage, dealers are bullish. Scrap generation continues low, but better weather may change this situation. Auto list tonnage is only about half of normal and spirited bidding is expected as local mills bid against export demand.

Cincinnati — Fairly heavy shipments are going upriver as area mills take only small tonnage. The price is up $1 on the best dealer grades based on broker buying. It could increase even more next month if local mills up their buying.

St. Louis—The feeling is being expressed here that a general price increase is near. Very little scrap is moving as dealers hold out for higher prices in the future. Small amounts of scrap are moving out of the area at higher prices.

Birmingham — A Gadsden mill released orders held up since las month and made some purchases of No. 1 railroad heavy melting scrap at $1 above present prices. Otherwise, there is very little buying. But there is continued pressure from exporters to keep prices firm.

Buffalo — The market continues dead with area mills still showing no interest in scrap. Prices remain unchanged.

Boston — Warmer weather has brought additional activity, both domestically and in exports. The new activity has resulted in several price rises.

West Coast—There are reports that the Japanese will buy 250,000 tons of scrap on the West Coast during the next quarter. That's 10 pct more than this quarter. Major mills remain quiet, but may show interest soon.

Houston — Export continues to give the market some life. The district mill made an offer to buy selected items but the domestic market is quiet.

SCRAP PRICES *(Effective February 20, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs plate	38.00 to 39.00
Heavy turnings	27.00 to 28.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	43.00 to 44.00
Rails, 2 ft and under	47.00 to 48.00
RR specialties	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	85.00 to 90.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	40.00 to 41.00
Low phos. punch'gs plate, ¼ in. and heavier	38.00 to 39.00
Low phos. 2 ft and under	36.00 to 37.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	55.00 to 57.00
Rails 2 ft. and under	47.00 to 48.00
Angles and splice bars	41.00 to 42.00
RR steel car axles	56.00 to 57.00
RR couplers and knuckles	40.00 to 41.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	41.00 to 42.00
Cast iron wheel	32.00 to 33.00
Malleable	44.00 to 45.00
Stove plate	35.00 to 36.00
Steel car wheels	39.00 to 40.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	90.00 to 95.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	20.00 to 21.00
Clean cast. chem. borings	25.00 to 26.00
Low phos. 5 ft and under	40.00 to 41.00
Low phos. 2 ft punch'gs	42.00 to 43.00
Elec. furnace bundles	40.00 to 41.00
Heavy turnings	25.00 to 26.00
RR specialties	42.00 to 43.00
Rails, 18 in. and under	50.00 to 52.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	41.00 to 42.00
Malleable	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.50 to $28.50
No. 2 hvy. melting	25.50 to 26.50
No. 1 dealer bundles	28.50 to 29.50
No. 2 bundles	19.00 to 20.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	36.00 to 37.00
Rails, random length	39.00 to 40.00
Rails, 18 in. and under	45.00 to 46.00
No. 1 cupola cast.	37.00 to 38.00
Heavy breakable cast.	29.00 to 30.00
Drop broken cast.	46.00 to 47.00

Youngstown

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	20.50 to 21.50
Machine shop turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Low phos. plate	35.50 to 36.50

Cleveland

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	19.50 to 20.50
No. 1 busheling	31.00 to 32.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Cut structural & plates, 2 ft & under	36.00 to 37.00
Low phos. punch'gs plate	32.00 to 33.00
Drop forge flashings	31.00 to 32.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR hvy. melting	33.00 to 34.00
Rails 2 ft and under	46.00 to 47.00
Rails 18 in. and under	47.00 to 48.00
Steel axle turnings	23.00 to 24.00
Railroad cast.	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	39.00 to 40.00
Malleable	44.00 to 45.00
Stainless	
18-8 bundles	160.00 to 165.00
18-8 turnings	80.00 to 90.00
430 bundles	75.00 to 80.00

Buffalo

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	25.00 to 26.00
No. 1 dealer bundles	25.00 to 26.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	13.00 to 14.00
Low phos. plate	33.00 to 34.00
Structurals and plate, 2 ft. and under	35.00 to 36.00
Scrap rails, random lgth.	34.00 to 35.00
Rails 2 ft. and under	44.00 to 45.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	36.00 to 37.00

St. Louis

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.00 to 26.00
Foundry steel, 2 ft.	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	19.00 to 20.00
No. 1 RR hvy. melting	32.00 to 33.00
Rails, random lengths	37.00 to 38.00
Rails, 18 in. and under	41.00 to 42.00
RR specialties	39.00 to 40.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	36.00 to 37.00
Cast iron car wheels	33.00 to 34.00
Rerolling rails	49.00 to 50.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft. & under	34.00 to 35.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft.	37.00 to 38.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rail, random lgth.	40.00 to 41.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	37.00 to 38.00
No. 1 cupola cast.	44.00 to 45.00
Stove plate	44.00 to 45.00
Cast iron car wheels	35.00 to 36.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	16.00 to 17.00
Machine shop turnings	2.00 to 3.00
Mixed bor. and turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	17.00 to 18.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	22.00 to 23.00
Drop forge flashings	23.00 to 24.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Heavy breakable cast.	26.00 to 27.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	37.00 to 38.00
Stainless	
18-8 bundles and solids	145.00 to 150.00
18-8 turnings	45.00 to 50.00
430 bundles and solids	50.00 to 55.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.50 to $26.50
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	13.00 to 14.00
No. 1 busheling	25.00 to 26.00
Machine shop turn.	3.00 to 3.50
Shoveling turnings	5.50 to 6.00
Clean cast. chem. borings	13.50 to 14.50
No. 1 machinery cast.	39.00 to 40.00
Mixed cupola cast.	31.00 to 32.00
Heavy breakable cast.	26.50 to 27.50

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	$27.00 to 28.00
No. 2 bundles	18.00
Machine shop turn.	14.00
Cast iron borings	14.00
No. 1 cupola cast.	46.00 to 48.00

Los Angeles

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	17.00
Machine shop turn.	12.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furnace 1 ft. and under (foundry)	42.00
No. 1 cupola cast.	43.00 to 44.00

Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	31.00
No. 2 bundles	21.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.50
No. 1 dealer bundles	28.50
No. 2 bundles	18.00
Mixed steel scrap	20.00
Bush., new fact., prep'd.	28.50
Bush., new fact., unprep'd.	22.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	21.00
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$43.00 to 44.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	33.00 to 34.00
Heavy breakable cast.	25.00 to 26.00

Copper Sales Up As Output Slumps

Copper deliveries to U. S. fabricators increased in January. But mine production fell below the December 1960 level.

Sales executives expect little improvement in February, although there's a "better feeling."

■ Though mine production slumped, copper sales jumped in January. Sales executives of some major U. S. copper companies expect little further improvement in February, however.

The Copper Institute reports January deliveries to U. S. fabricators rising to 99,794 tons, from 91,163 tons in December, 1960. The recovery matched the November 1960 level of 99,749 tons.

Mine production dropped to the lowest level since September, 1960. In January, 99,342 tons were mined, compared with 102,134 tons in December.

Lowest Since July—Refinery output slipped to 144,697 tons, from 152,211 tons in December. The January level was the lowest since July, 1960, a vacation month.

Further production cuts aren't sighted in February or March, so any further closing of the sales-production gap must come from better shipments. Producers don't forecast this at present.

One sales vice president says any February change is likely to mean more deliveries, rather than less. But this is the most optimistic statement any industry spokesman will make.

Copper salesmen agree, though, there is "a better feeling" in the market. Buyers aren't as pessimistic as they have been for the past six months. But there is no solid evidence buyers will convert these views into orders.

Copper faces the same problem as most basic materials. The outlook now is based on what's happening to the general economy.

Foreign Picture — Foreign trade continues to be the brightest spot in the copper picture.

Refinery production was up and deliveries fell slightly in January. But the 214,645 tons delivered to fabricators outside the U. S. greatly tops the output of 176,851 tons.

In December 1960, production totaled 166,529 tons while deliveries soared to 225,811 tons.

U. S. salesmen expect this surge in deliveries to foreign fabricators, primarily European, to continue.

Aluminum

The U. S. became a net exporter of crude aluminum in 1960, but exports of semifabricated shapes again trailed imports.

The Dept. of Commerce reports crude aluminum exports doubled in 1960 to 569.9 million lb, from 242.1 million lb in 1959. Imports dropped to 309.4 million lb from 479.9 million lb in 1959.

West Germany and the United Kingdom made the export difference. Shipments to West Germany jumped from 37.6 million lb in 1959 to 151.2 million lb in 1960, an increase of 302 pct.

Shipments to the United Kingdom jumped 115 pct, to 236.2 million lb in 1960. This is just short of the total 1959 exports.

Gap is Closing—Semifabricated shapes continued to be imported more than exported in 1960. But the export-import gap is closing.

Imports dropped to 83.1 million lb in 1960, from 110.5 million lb in 1959. Exports advanced to 47.1 million lb in 1960, from 33 million lb in 1959.

Scrap Exports Up—The U. S. continued to be a big scrap exporter.

Imports dropped more than 50 pct, from 21.8 million lb in 1959 to 10 million lb in 1960. But scrap exports leaped from 64.7 million lb in 1959 to 159 million lb in 1960.

Magnesium

Magnesium mine production was up but shipments of wrought products down in 1960.

The Magnesium Association reports primary output in 1960 at 40,007 tons, compared with 31,033 tons in 1959. Shipments dropped from 11,090 tons in 1959 to 10,359 tons in 1960.

Tin prices for the week: Feb. 14 —100.875; Feb. 15—100.00; Feb. 16 — 101.25; Feb. 17 — 101.125; Feb. 20—101.50*.
* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum ingot	26.00	24.70	12/17/59
Copper (E)	29.00	30.00	1/16/61
Copper (CS)	29.00	30.00	1/11/61
Copper (L)	29.00	30.00	1/16/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/58
Titanium sponge	150–160	162–182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 137.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.038-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size*	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 3/4
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	103.1
AZ31B Spec.		93.3	96.9	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	55.32
Brass, Yellow	48.10	48.39	48.04	52.26
Brass, Low	50.65	50.94	50.59	54.71
Brass, Red	51.54	51.83	51.48	55.60
Brass, Naval	52.86	59.17	46.67	57.02
Munts Metal	50.94	.....	46.25	.....
Comm. Bz.	52.98	53.27	52.92	56.79
Mang. Bz.	56.80	.....	50.20	.....
Phos. Bz. 5%	74.59	74.34	75.09	76.52

Free Cutting Brass Rod 33.71

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb). .$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz..$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 27.25
- No. 120 ..... 26.25
- No. 123 ..... 25.25

80-10-10 ingot
- No. 305 ..... 31.75
- No. 315 ..... 29.50

88-10-2 ingot
- No. 210 ..... 39.50
- No. 215 ..... 36.25
- No. 245 ..... 31.50

Yellow ingot
- No. 405 ..... 22.75

Manganese bronze
- No. 421 ..... 26.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.25-24.50
- 0.60 copper max. 24.00-24.25

Piston alloys (No. 132 type)..26.00-27.00
No. 12 alum. (No. 2 grade)...22.75-23.25
108 alloy 23.25-23.75
195 alloy 25.75-26.75
13 alloy (0.60 copper max.)...24.00-24.25
AXS-679 (1 pct zinc) 23.00-24.00

(Effective Feb. 20, 1961)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 23.75-24.75
Grade 2—92-95% 22.50-23.50
Grade 3—90-92% 21.50-22.50
Grade 4—85-90% 21.00-22.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24¼
Yellow brass	19¼	17⅝
Red brass	22¼	21½
Comm. bronze	23	22¼
Mang. bronze	18⅛	17⅝
Free cutting rod ends.	18⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 25
- No. 2 copper wire 23
- Light copper 20¾
- *Refining brass 21¼
- Copper bearing material 20½

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 24½
- No. 2 copper wire 23
- Light copper 20½
- No. 1 composition 20
- No. 1 comp. turnings 19
- Hvy. yellow brass solids 15
- Brass pipe 14
- Radiators 16

Aluminum

- Mixed old cast. ..... 12 —12½
- Mixed new clips ..... 13¾—14¼
- Mixed turnings, dry ..... 12¾—13¼

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 21½—22
- No. 2 copper wire ..... 19½—20
- Light copper ..... 17½—18
- Auto radiators (unsweated).. 12¼—12¾
- No. 1 composition ..... 16¼—16¾
- No. 1 composition turnings... 15¼—15⅝
- Cocks and faucets ..... 12¾—13¼
- Clean heavy yellow brass ... 12¼—12⅝
- Brass pipe ..... 13¼—13⅝
- New soft brass clippings .... 13¼—13⅝
- No. 1 brass rod turnings .... 13¼—13¾

Aluminum

- Alum. pistons and struts .... 6½— 7
- Aluminum crankcase ..... 8½— 9
- 1100 (Ss) aluminum clippings 11½—12
- Old sheet and utensils ..... 8½— 9
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 9 — 9½
- 2020 (24s) clippings ..... 10 —10½

Zinc

- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 2¾— 3
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1 — 1¼

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 23-23.50
- Clean Monel turnings 16.50-17
- Old sheet Monel 22-23
- Nickel silver clippings, mixed. 18
- Nickel silver turnings, mixed. 15

Lead

- Soft scrap lead ..... 7 — 7½
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 73 —75
- No. 1 pewter ..... 55 —56
- Auto babbitt ..... 41 —42
- Mixed common babbitt ..... 9 — 9½
- Solder joints ..... 12½—13
- Small foundry type ..... 8½— 9
- Monotype ..... 8¾— 9¼
- Lino. and stereotype ..... 8 — 8¼
- Electrotype ..... 7½— 7¾
- Hand picked type shells ..... 5¼— 5¾
- Lino. and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2 — 2½

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh Midland Butler Aliquippa N. Castle McKeesport Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3, B4, M10* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

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IRON AGE

STEEL PRICES

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		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$9.20 *U1*	$6.35 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*				Holloware Enameling 29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.		
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	$6.25 *U1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	$6.35 *T2*
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Feb. 20, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.		5.675 *B3*									
	Fairless, Pa.	5.825 *U1*	5.825 *U1*									
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2, A10*		7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Feb. 20, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery; Charge	Sheets: Hot-Rolled (18 ga. & h'r.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	7.87	9.71	10.16	10.28	8.44	9.13	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	16.76	.....	.....
Boston	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.79	16.69	23.89	21.04
Buffalo	.15	8.70	9.45	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		10.90	12.53	13.27	13.07	10.74	11.24	10.88	12.97	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		10.17	10.98	11.35[3]	11.73	9.90	9.81	9.58	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	9.59	11.42	10.95	11.76	9.43	9.93	9.57	11.77	17.17	15.87	21.87	21.12
Los Angeles		9.50[1]	11.20	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.13	10.50	.....	10.79	8.81	9.16	8.97	12.89	.....	.....	.....	.....
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.24	20.49
New York	.10	9.77	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.95	10.10	10.99	10.45	8.80	9.05	8.85	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		9.45	11.30	12.35	11.45	9.60	10.05	9.45	16.65	18.60	17.80	22.70	22.20
San Francisco	.10	10.27	11.79[2]	11.50	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.15
Spokane	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.75	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	8.9‡	9.84	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Feb. 20, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	73.00
Lyles, Tenn. *T3*	.....	.....	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50–32.75	32.00	29.50–34.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	33.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet. *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit. *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Feb. 20, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	.....	.....	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	193	...	214	199	9.10	9.85
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184–1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
Sparrows Pt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

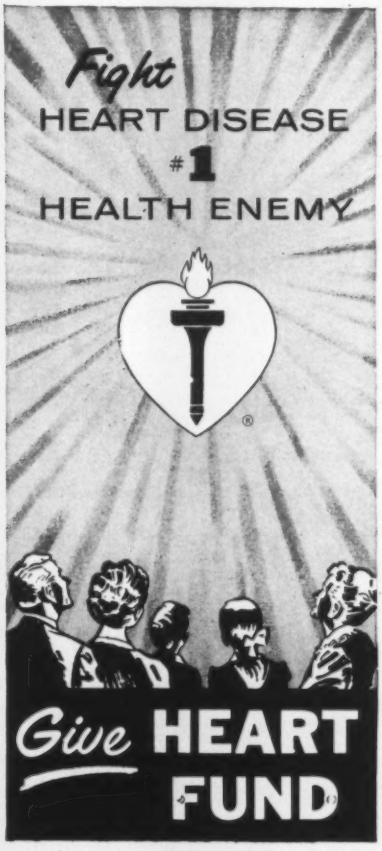
CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75



RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25			
Cleveland *R3*						15.35
So. Chicago *R3*				10.10		
Ensley *T2*	5.75	6.725				
Fairfield *T2*		6.725		10.10	6.875	
Gary *U1*	5.75				6.875	
Huntington, *C16*		6.725				
Ind. Harbor *I3*				10.10		
Johnstown *B3*		6.725				
Joliet *U1*			7.25			
Kansas City *S2*				10.10		15.35
Lackawanna *B3*	5.75	6.725	7.25		6.875	
Lebanon *B3*			7.25			15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*						15.35
Pittsburgh *J3*				10.10		
Seattle *B2*					6.75	15.85
Steelton *B3*	5.75		7.25		6.875	
Struthers *Y1*				10.10		
Torrance *C7*					6.75	
Williamsport *S5*		6.725				
Youngstown *R3*				10.10		

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10				
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.15
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 43.50
Electrodeposited, 5000 lb lots ... 36.50
OFHC anodes ..... 40.50 to 43.50
(depending on shape)

Brass, 80-20, ball anodes, 2000 lb or more 50.50

Zinc, ball anodes, 2000 lb lots 19.75
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.0225
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.50

Tin, ball anodes $1.05 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90
Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45
Nickel sulfate, 5000 lbs 29.00
Nickel chloride, freight allowed, 100 lb 45.00
Sodium cyanide, domestic, f.o.b. Chicago, 200 lb drums 24.00
Zinc cyanide, 100 lb, N. Y. 60.75
Potassium cyanide, 100 lb drum N. Y. 45.50
Chromic acid, flake type, 10,000 lb or more, N. Y. 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
Carbonyl Iron (200 lb lots) 88.00
Welding Grades 8.10
Cutting and Scarfing Grades 9.85
Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades
Electrolytic, domestic, f.o.b. shipping point. 15.00†
Atomized ..... 42.3 to 60.3
Reduced ..... 15.00†
Chemically Precipitated 43.5
Brass, 5000-lb lots ..... 32.3 to 48.9
Bronze, 5000-lb lots ..... 50.3 to 54.2
Chromium, electrolytic 5.00
Lead ..... 7.50†
Manganese, electrolytic ... $1.00
Molybdenum ..... $3.60 to $4.35
Nickel $1.15
Carbonyl Nickel, 20,000 lb lots $1.01
Nickel-Silver, 5000 lb lots.. 57.9 to 65.9
Silicon 70.00
Solder ..... 7.00†
Stainless Steel, 316 ..... $1.07
Stainless steel 304 ..... 89.00
Tin ..... 14.00†
Titanium, 99.25 + pct, per lb, f.o.b. $11.25
Tungsten, carbide grades... $3.25
Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.875	
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor		12.475	
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*)· Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, $43.00; 1 side, $36.10.

(Effective Feb. 20, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00
High duty (except Salina, Pa., add $5.00) 140.00
Medium duty 125.00
Low duty (except Salina, Pa., add $2.00) 103.00
Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00
Childs, Hays 163.00
Chicago District 168.00
Western Utah 183.00
California 185.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. 163.00-168.00
Silica cement, net ton, bulk, Chicago 26.75
Silica cement, net ton, bulk, Ensley, Ala. 27.75
Silica cement, net ton, bulk, Mt. Union, Pa. 25.75
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Chrome Brick

Standard chemically bonded, Baltimore, Md. $620.00
Gary, Ind. 658.50
Standard, Pascagoula, Miss. 647.50
Standard chemically bonded, Curtiner, Calif. 119.00
Burned, Baltimore 585.00

Magnesite Brick

Standard, Baltimore $715.00
Chemically bonded, Baltimore 655.00
Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅜ to ½-in. grains
Per net ton

Domestic, f.o.b. Baltimore in bulk. $73.00
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Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
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CAnal 6-2470

Chicago Area Trade Lacks Strength

Used machinery dealers in the Chicago area say activity is following the normal pattern: Business drops off toward the end of the month.

Prospects for the future are also weak.

■ The Chicago area used machine tool market appears to be grinding along at dead center as February draws to a close.

Rebuilders report that the usual pattern of a gain in inquiries at the opening of the month, followed by a steady dropoff, has again been the rule for February. The general feeling in the rebuilt machine tool field is that there are plenty of customers who need the equipment, but that management will not free cash for purchases until the need becomes absolutely critical.

As a result, rebuilding work shows no gains. And, in a few instances, it appears to have fallen slightly below January levels. Forecasts are not strong.

While a few used machinery men see possible March gains, they'll admit that they have nothing to base these hopes on. But they know customers need the equipment.

Seasonal Gains—With the approach of spring, sheet metal fabricating equipment has shown at least some seasonal gains over the past two weeks. Orders have been received from western areas, and several sources find activity in the south stronger than expected.

If there are signs of overall improvement, they are hard to spot and confined to metal fabricating equipment. But a few improvements can be spotted.

Several orders were received recently from customers who've been dormant for months. At the same time, "referrals" netted a few Chicago area dealers orders.

Continued Weakness—Indicative of the general market standstill is the reported continuing weakness in milling machine prices.

Some local gains in steel mill operations, farm equipment, appliance, electronics, and building products haven't produced gains in sales of used equipment to these industries. The possible exception is the building products market where a few new sales turned up in the last month. But since this market is seasonal and the very mild upturn noted thus far coincides with a usual spring gain, dealers don't regard this as a very convincing sign that business is improving generally.

Tight Money — Cash for purchases continues to be tight. There are a growing number of requests for credit or credit extensions. A new version of the same thing amounts to a "lay away" plan for used tools. Buyers will call, request that a certain machine tool be held for them, and then won't take shipment. When the dealer calls later he's told that they still want the tool but aren't ready to accept delivery yet.

The tool supply outlook is strong. A government list of 600 tools offered for auction in the east is under consideration by some Chicago area dealers.

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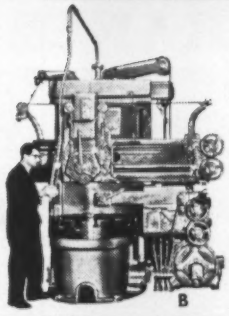

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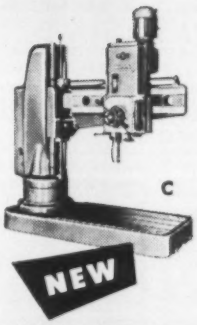

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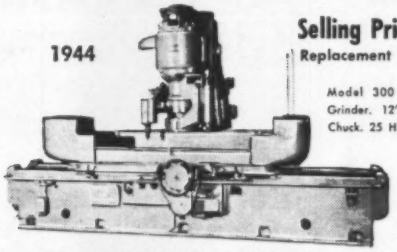

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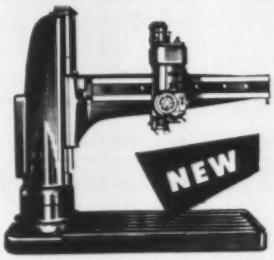

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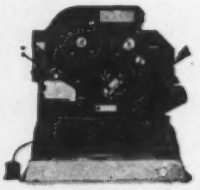

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MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

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Introducing the PLUS + POSITIVE

An improvement in Centralized Lubrication—

far better than anything offered before

- PRECISE METERING OF LUBRICANT—from drops to .300 cu. in.
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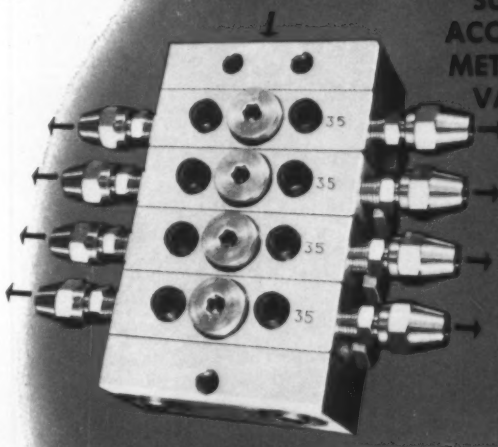
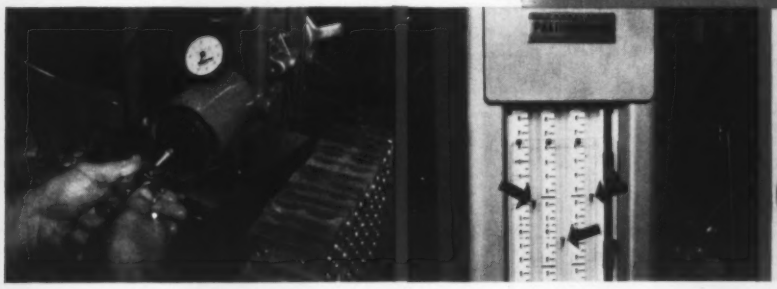
- BUILT-IN CHECK VALVES—assures positive error-proof operation.
- SHORTER—FULL-FLOW PASSAGES—for minimum pressure drop . . . maximum lubricant flow.
- NEW 3-LOBED PISTON DOUBLES SEALING AREA.

**Write for more information on Trabon's new Broken Line Indicator—the all-hydraulic (non-electric) central-signalling warning device.*





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Individual "Match-honing" of Cylinders to fit each 3-lobed piston provides superior sealing—accurate metering.

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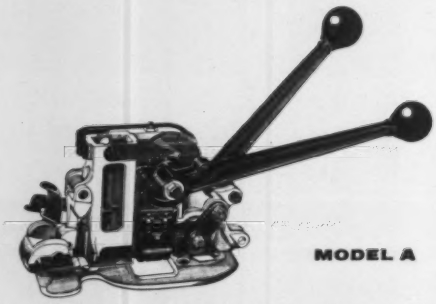
Use 5/8" or 3/4" strapping?

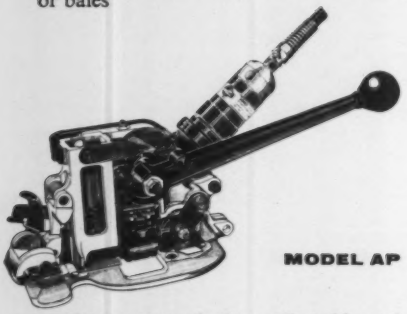
Choose right from this one full line of combination tools

for steel strapping in all sizes from 5/8"x.015" to 3/4"x.035"



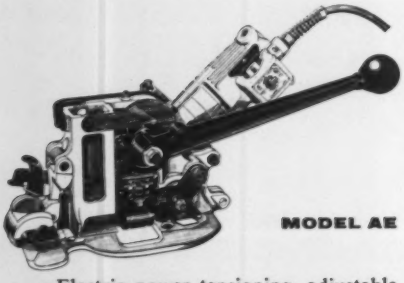
MODEL A

- Manual tensioning, sealing and severing. One handle tensions, the other seals and severs with a single stroke
- Rugged, easy to use...for high tension applications on heavy loads, such as paper, bricks, ingots, crates, machinery or bales



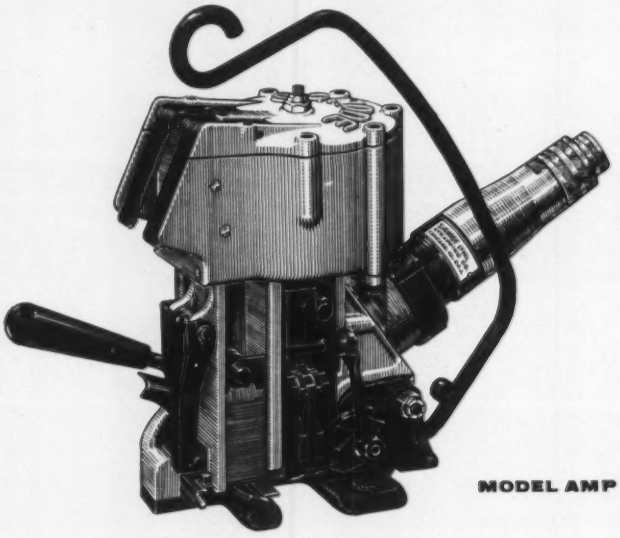
MODEL AP

- Air power tensioning, adjustable and automatically regulated
- Applies pre-set tension every time
- Manual single-stroke sealing and severing
- Automatic seal feed magazine holds 75 seals



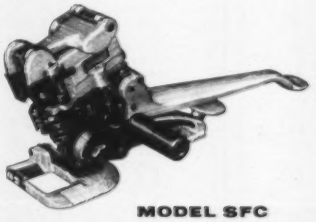
MODEL AE

- Electric power tensioning, adjustable and automatically regulated. Also applies pre-set tension every time
- Manual single-stroke sealing and severing
- Automatic seal feed magazine holds 75 seals



MODEL AMP

- Fast, new all-power-operated portable tool from Signode
- Air power tensioning, sealing and severing, all push-button controlled
- Tensioning is adjustable and automatically regulated
- Automatic seal feed magazine holds 75 seals



MODEL SFC
the only one-hand strapping tool

- Manual tensioning and sealing; strap is scored rather than severed
- Because seals are fed from a magazine and the tool weighs only 6 pounds, one-hand operation is convenient
- Unexcelled tool for general shipping room use, with 5/8", 3/4" (and 1/2") strapping up to .023" gauge.

Signode offers the only complete line of combination tools for 5/8" and 3/4" steel strapping—lets you choose the right tool for efficient strapping at the speed your operations require. Let us ask the Signode man near you to demonstrate any or all of these tools...or write for free booklets #238 and #251.

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